SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

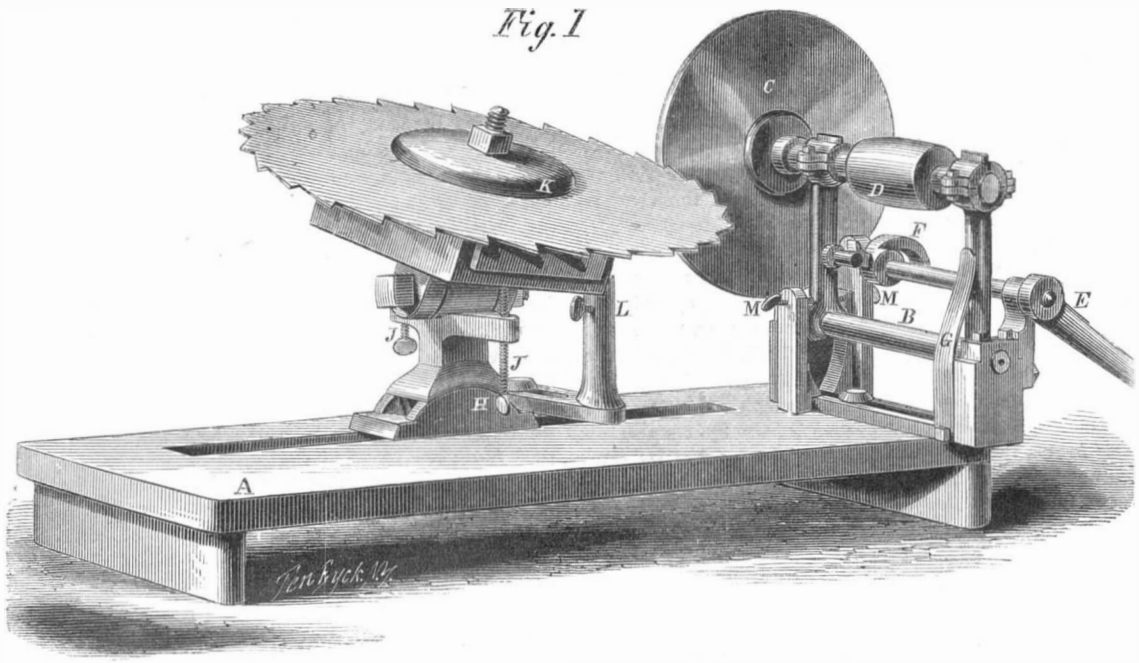
Vol. XVIII.—No. 8. [NEW SERIES.] NEW YORK, FEBRUARY 22, 1868. $3 per Annum [IN ADVANCE.]

Improvement in Gumming and Sharpening Saws.

One of the difficulties experienced by practical sawyers in the use of their saws is the trouble of keeping them in working order. A large portion—too large—of their time is expended in filing, gumming, or adjusting their saws. A handy, cheap, and portable contrivance for this purpose is certainly a desideratum. The one shown in the engravings contains all these requisites. It may be temporarily affixed to any bench, moved from one place to another, and is adapted to all sizes and styles of saws. The saw, whether circular or straight, can be presented to the gumming wheel at any angle.

Fig. 1 is a perspective view of the machine in position for operation; Fig. 2 shows the method of securing a straight saw to its bed in readiness to be operated upon by the emery wheel. Let A represent a table, or a section of a work bench, with a slot for receiving the standard of the saw support. The standard which holds the gummer or emery wheel and its appliances has a slotted bottom through which and the bench passes one or more bolts by which it is held in position, the slot allowing for lateral adjustment. The uprights, which have the journal boxes on their upper end, are secured to the shaft, B, allowing a swinging or rocking movement to the gummer, C, and its shaft, which is driven by a belt on the pulley, D. The gummer is advanced to the work by the lever, E, on the shaft of which is a cam, F, working against a stud on the inner side of one of the uprights. A spring, G, returns the gummer to place when the pressure on the lever, E, is withdrawn.

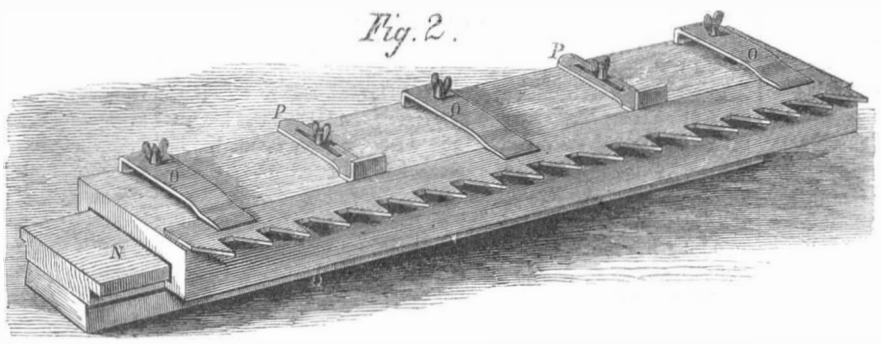
Fig. 1



MARKLAND'S PATENT ADJUSTABLE SAW GUMMER

The foot of the saw support is pivoted or hinged to the base, H, both being held firmly to the bench by a bolt passing through the slot. This allows the saw to be set at an angle to the gummer. The saw is canted in the transverse direction by a joint and bolt, which permits teeth of any angle of edge to be adjusted to the gummer. Two screws, J, hold the bed of the saw in the position desired. The bed itself, is dove-tailed, and a corresponding sliding block fits the recess, and is held by a set screw. The bolt, which, with the flanges, K, hold the saw to the block, is small enough to fit the smallest eye, and larger eyes are fitted by means of properly sized thimbles. The stand, L, supports an adjustable rest to steady the edge of the saw on which the gummer is at work. The amount of forward and backward movement of the gummer frame is governed by thumb screws Fig. 2 is a sliding rest for holding straight saws, its lower portion, N, being formed to fit the same bed as that which the block for holding the circular saw fits. The saw is held by the clamps, O, and adjusted to place by the stops, P. Small fans may be attached to the flanges which secure the gummer to the shaft, one on each side, to keep the teeth of the saw cool while being operated upon. A pan of ice on the bench under the gummer will serve to cool the air before it is taken up by the fans.

Fig. 2.



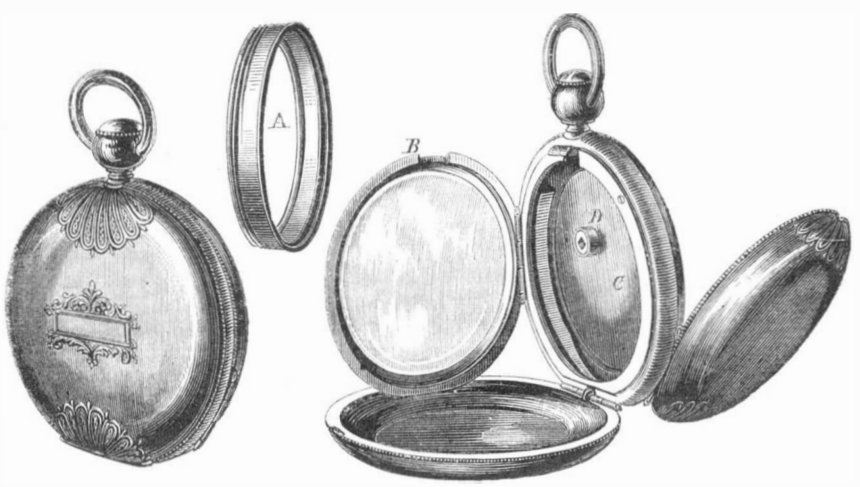
The operation of the machine may be readily understood from the foregoing detailed description and the engravings. It was patented April 2, 1867, by Thomas T. Markland, Jr. The machines will be furnished on application to J. B. Bartlett & Co., 248 South Eighth street, Philadelphia, Pa.; J. B. Bartlett & Sons, 924 Arch street, same city, or W. H. Miles, 117 John street, New York.

Improved Watch Case.

The actual wear of watch movements, apart from the presence of dirt, is very slight. A watch must be kept clean if good results are expected; but it has been found difficult to so construct a watch case that it will not, after being used a short time, admit not only moisture but particles of dust. The patentee of the improved watch case shown in the engravings, however, is confident of having constructed a case which is both dust and water tight; and practical watch makers, including the celebrated American Watch Company of Waltham, Mass., indorse it as a valuable improvement.

As will be seen, it is a capped or hunting case made quite heavy. Inside the center or body portion, on which the back and cover close, fits a ring, A, having a thread cut on one edge of its exterior surface engaging with a corresponding thread on the inside surface of the center, or is secured by studs, pins, or other suitable devices. To this ring the movement is attached, and the bezel, B, containing the crystal, and the cap, C, snap over the edges of the ring, making a perfect case for the movement, in addition to the center, back, and cover, forming the outer case. The cap, C, has a box or tube, D, surrounding the key hole, and embracing the fusee arbor, inside of which tube is placed a packing of soft chamois skin, or other suitable substance, rendering the whole impervious to all foreign substances.

The inventor states that he immersed a watch, inclosed in one of these cases, in water over night without any damage to the movement, and that watches provided with the improved case are eminently fitted for persons employed about engines—stationary, fire, or locomotive—in mines, flour mills, etc. The patent was obtained through the Scientific American Patent Agency, by S. D. Engle. The device is applicable to all styles of watches. Further information relative to the improvement may be obtained by addressing Messrs. Jacot & Brother, No. 9 South Second street, Philadelphia, Pa.



ENGLE'S PATENT AIR TIGHT WATCH CASE.

Dissolving Bones.

The importance of phosphates, such as common bones, as fertilizers, especially in grain culture, could hardly be extolled, and it would be presuming upon the intelligence of our farmers to say more than to recommend their application. There exists, however, some obstacles which yet prevent waste bones, nearly always cheap and within easy reach, from being generally used. The great distances in the far west, and other inconveniences, render their purchase in powder form expensive, and for grinding them at home, or dissolving in acid, there is still less chance.

Professor Ilienhof, in Russia, has, however, lately discovered a method for dissolving them, which must prove highly economical and suitable in unsettled countries, where, owing to the great abundance of forests, wood ashes are cheaply secured—indeed, are almost always ready at hand. This new process of treating bones consists of mixing them with wood ashes and slaked caustic lime, and keeping the mixture constantly moist. As in the preparation of lye for manufacturing soap, the alkaline carbonates in the ashes, such as carbonate of potassa, are by the action of caustic lime converted into free caustic potassa, attacking and quickly dissolving the bones.

The following practical example will illustrate the necessary proceeding. Suppose the wood ashes to contain about 10 per cent carbonate of potassa, and that 4,000 pounds of bones are to be worked up; then we take 4,000 ponnds of ashes, 600 pounds of caustic lime, and 400 to 500 pounds of water. A ditch, some two feet deep, of such width and length as to hold 6,000 pounds of the mixture, is dug, and near it a second ditch, being some 25 per cent larger, and both lined with boards. The lime is then slaked, and, when crumbled to a powder, mingled with the wood ashes; and 2,000 pounds of bones piled up in layers, and covered up with the mass in the smaller ditch; 3,600 pounds of water added, and the whole left to itself. From time to time small quantities of water are added, to keep the mass moist. As soon as it is found that the bones are so far decomposed that when pressed between the fingers they are soft and crumble, the second portion—*i.e.*, the other 2,000 pounds of bones—is brought into the larger ditch, and covered in layers with the first mass, and left to decompose.

After the whole mass has undergone decomposition it is suffered to dry, by removing it; and, lastly, to facilitate its reduction to powder, mixed with 4,000 pounds of dry turf, or some other dry vegetable earth. The mixture is repeatedly stirred about with a shovel and may at once be brought upon the fields. Manure prepared thus will contain about 12 per cent of tribasic phosphate of lime ($3\ CaO,\ PO_5$), 2 per cent of nitrogenous matter. This manure must, from its composition, produce an admirable effect upon grape vines. Liebig, in generally recommending this new fertilizer, thinks an addition of gypsum an improvement for many kinds of fruits.—*Agricultural Report.*

Sheep Wash.

Tobacco juice has long been employed with success as a wash for sheep to keep them clear of vermin. What a pity that the wasted expectorations of tobacco chewers could not in some way be economized. The liquid saved would be more than sufficient to swim all the sheep in the world. Edward B. Booth, of St. Louis, Mo., has lately patented a sheep wash as follows:

"The object of my invention is to produce a liquid com-

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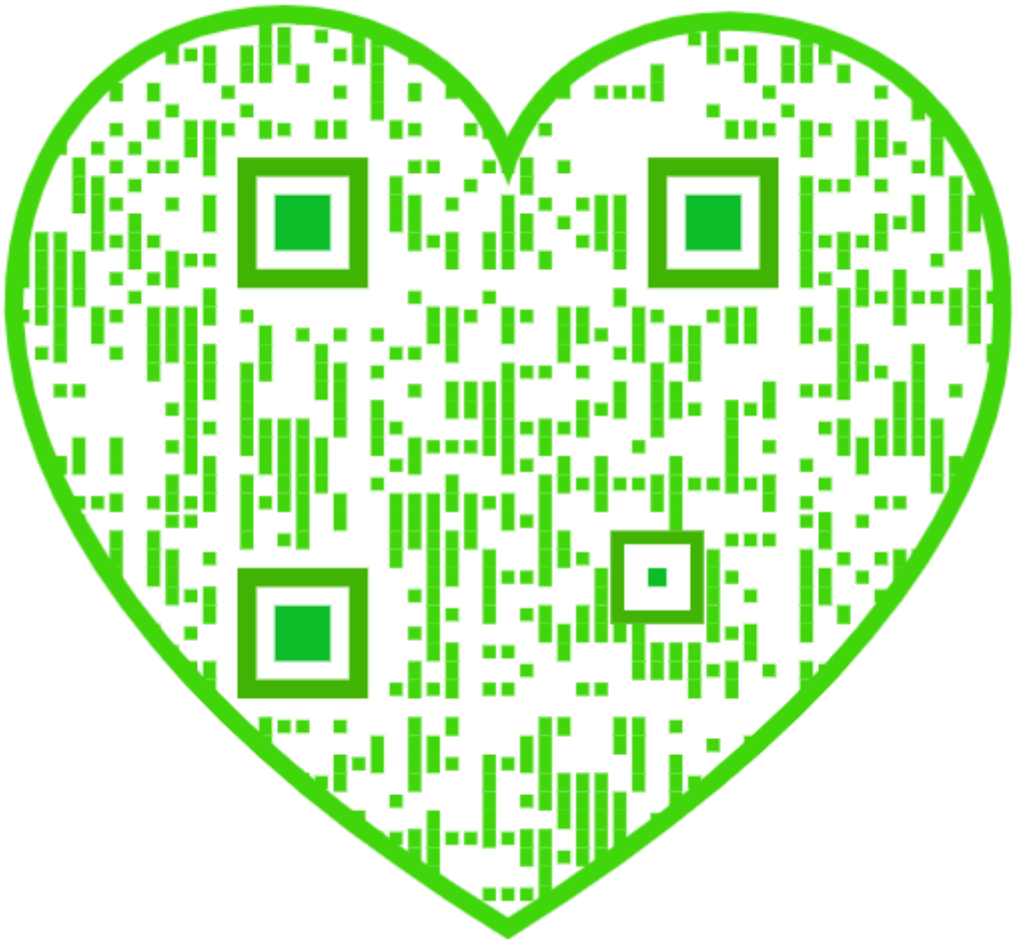

pound that will keep the skin of sheep in a healthy condition free them from scab and vermin, and keep the wool clear of vermin.

"I take 100 pounds of tobacco, refuse, stems, etc., and boil it in 50 gallons of water long enough to produce 40 gallons of the extract of tobacco, which will be from one to six hours, according to the degree of heat and strength of the tobacco. While the liquid is hot I add to it gradually common pulverized chalk, till effervescence ceases. Then, when this mixture is cool, I add 1 gallon of tersulphide of calcium, prepared in the usual way, and mix thoroughly.

"When the compound is to be applied, one pint must be diluted with one gallon of water, and then the sheep washed with or immersed in it. This is equally efficacious when applied to cattle and other animals."

EDITORIAL CORRESPONDENCE.

Passports in France—The Antiquities of Nimes—Pont du Gard—Avignon—Papal Palaces—Laura's Grave—Hercules and the Ligurians—Marseilles to Nice—A Trip over the Corniche Road—From Geneva to Spezzia—A Magnificent Sight.

SPEZZIA, Jan. 9th, 1868.

On quitting Spain we spent our first night in France at Perpignan, a dull, ancient, strongly fortified city, not far from the frontier. For some unexplained, reason when we alighted from the diligence, where we had been "cribbed, cabined, and confined" for ten hours, an officer approached and civilly asked for our passports, and in the morning, as we were about to take the train for Nimes, we were again requested to produce them; but the officer took our word that we were traveling Americans, and permitted us to go about our business. It should be understood that France professes to have dispensed with the passport system, therefore it appeared to us singular that we could not come and go to and from old Perpignan without passports. We surmised that this excessive vigilance was occasioned by some convention between Spain and France, to prevent the escape of those Spaniards who were concerned in the revolution that broke out last spring in the province of Catalonia, a province bordering this portion of France. Francis Arago, the celebrated astronomer, was born in a small town near to Perpignan, and for many years was a representative in the French Assembly.

Our journey led us through the old city of Narbonne, which boasts of Roman antiquity, but is now chiefly celebrated for its industrious bees, who gather a highly aromatic honey from a disconsolate looking heath in the vicinity. This whole region, however, has a mournful, bloody interest connected with the heretical Albigenses, who were cruelly put to death in answer to the call of the Church of Rome. The historian asserts that 60,000 were massacred, but the inhuman abbot declared in a letter to Innocent III. that he could only slay 20,000. "Kill all," said he; "the Lord will recognize his own." Here the vine is extensively cultivated, and some exquisite qualities of wine are produced, such as the sparkling St. Peray, which is made from the natural juice of a sweet grape, and accounted to be more wholesome than the common sweetened champagne. "The nearer the bone the sweeter the meat." So it is here in these wine producing districts—the rougher the soil the sweeter the wine. Throughout this section there are also numerous unwholesome lagoons of salt water, from which an immense quantity of salt is produced by solar evaporation.

Nimes is one of the oldest and most interesting cities in France, and abounds in remarkable and well preserved Roman remains and antiquities. The old city has narrow, ill-regulated streets or lanes, but in the newer portions the streets are broad avenues. Beside, there are fine parks, gardens and promenades, well shaded and well kept. I think, on the whole, that it is one of the prettiest cities in France—a spot where the weary traveler might comfortably stop to rest for a few days to repair damages, and recruit for a trip towards Italy. There are upwards of a hundred distilleries in Nimes, but the people appear to be sober and industrious. It is not known who founded the Ampitheater, but it is said to be much better preserved externally than the Coliseum at Rome. The building is oval-shaped, seventy feet high, with double row of arcades or galleries, sixty on each story, the lower ones serving as so many entrances to the arena and galleries. It is probable that 20,000 spectators could be accommodated, as there are thirty-two tiers of stone seats rising one above the other. Recent excavations have led to the discovery of a sub-arena, which is supposed to have contained an artificial forest of trees, which were elevated during the time when animals were fought in the presence of the Roman Emperor and on other great occasions.

The guide who conducts visitors through the building assured us that this was the idea which archæologists entertained respecting the sub-arena. It might just as well be that as anything else. A few workmen are kept employed in repairing such portions of the Ampitheater as threaten ruin, and some restorations have been successfully carried out. The arena is now used for very innocent French bull fights, which differ from those in Spain in this, that French bull fights are perfectly bloodless exhibitions, as the law does not permit any wounding of the animal; they simply tease and annoy him.

Here is also to be seen a little Corinthian temple, a beautiful and well preserved specimen of architecture—a miniature of the splendid Church of the Madeleine in Paris. At one time this temple was degraded to the purposes of a horse stable, but it is now used as a museum for antiquities found in the neighborhood, and some pictures, one of which, the master-piece of Delaroche, represents Cromwell lifting the lid of Charles I.'s coffin, and looking at his headless corpse. The well preserved, double-arched Porte of Augustus, which now serves as the entrance to a stable yard, was erected sixteen years before Christ. Within the enclosure of a fine Public Garden are to be seen the Roman baths of Augustus, also the ruins of the Temple of Diana. During the progress of the excavation of the baths, a large Corinthian column, with a finely cut capital, was unearthed, and within the temple there are some splendid pieces of sculpture in marble, statues, and bas reliefs. During the past summer a laborer working about the roots of a rose bush, dug up a curious bas-relief, nicely chiseled, which represents "Old Father Time" discovering truth. In his wanderings about this world of care, Father Time, on one occasion, came across a man having three children, and was naturally curious to know whence they originated. Upon lifting a robe, or veil, he discovered a beautiful female figure concealed beneath its folds, and thus maternity was fully revealed. And thus it is that sooner or later time discovers truth. Upon a hill rising high above the garden, there is a singular tower, dismantled and broken. For what purpose was this high pile of stone erected? Some wise ones say it might have been a light house, but it being fifty miles from the sea, this hypothesis is not a supposable one. Some miserly gardener imagined that it might contain a rich treasure, but after considerable digging and searching, nothing was found, and to this day the old tower stands on on the hill-top, a curiosity for the curious. Perhaps "Old Father Time" may sometime aid the discovery of the truth in this case.

Ancient Nimes was supplied with water brought through an aqueduct a distance of twenty-five miles. A carriage drive of two hours, on the high road to Avignon, and a little turn up the valley of the river Gardon, brings you to "Pont du Gard," one of those grand, cyclopean structures for which the Romans were so famous. It consists in a range of triple arches, one rising above the other. In the lower range are six grand arches, spanning the river bed. The middle range has eleven arches. The top range has thirty-five, over which passes the U-shaped canal, carefully cemented and covered by flat stone, and large enough to admit the easy passage of an ordinary sized man. It is said that the Romans were ignorant of the hydrostatic law that water confined in a tube rises to the level of its source, therefore they incurred the enormous expense of building open aqueducts. The broken remains of this structure are visible for miles from where it crosses the Gardon, and the cement used for the lining is as hard as the granite rock itself. The aqueduct bridge has an elevation of 160 feet, and a length of 886, and is more grand for its severe simplicity, being constructed of heavy, granite blocks, wholly destitute of ornament. This Roman structure is in a wonderful state of preservation, and is now undergoing some repairs for the purpose of once more returning to its original duty of carrying water to Nimes. It has stood in its present solitude for nearly two thousand years, during which time sixty-six generations of living men have come and gone, kingdoms have risen, flourished and been destroyed,—indeed, how many strange thoughts and associations crowd upon the mind when one gazes for the first time upon structures raised by human hands, and which had a place upon the earth before our Saviour came to seek and to save that which was lost.

There are evidences that the river Gardon was at one time six feet at least higher than at present, and that the beautiful valley dotted with towns and villas, which opens below the rocky hights of Pont du Gard, was once wholly submerged; for at the base of the rocks, above the carriage road, are extensive caves worn out by the action of the waters. The jolly hermit who has a comfortable dwelling place for himself and little dog in one of the smaller caves, informed us that upon the annual feast of the Pentecost the pious villagers from La Foux come there to dance in the grand cave.

Avignon is a place of great historical interest, and I amagine that at the right time in the year it might be an agreeable spot to spend a few days, in rummaging about amid the rubbish of old papal palaces and Roman antiquities, which abound in and around the old, weather-beaten city; but we chanced to visit it when the *mistrale* was blowing violently, which chilled all our zeal for the dead past, and compelled us to think more of the present. The *mistrale*, at certain seasons, is the scourge of this section. It blows about three months in the year, and is bitterly cold, drying, and painful. Indeed, it requires a great stretch of the imagination to discover either poetry, romance, or beauty in this portion of "sunny France," although in the brains of some people it is esteemed as a sort of Paradise.

The Popes once lived and reigned, temporally and spiritually, at Avignon, after being driven out of Rome by the Prince Colonna, in the days of Gregory VI. The old palace, now used as a barrack for soldiers, still exists, and is altogether one of the ugliest structures in Europe. It has a long history of luxury, profligacy, tyranny, and blood, beginning in the 14th century and ending in 1791, when scores of innocent men and women fell victims to the infuriated French revolutionists, whose horrid crimes and butcheries are unmatched in the world's history, since Christianity came to bless mankind. Three usurpers of the papal authority, Clement VII., Benedict XIII., and Clement VIII., once occupied the old palace, and the good inhabitants of Avignon are even now indulging the hope that Pius IX. may decide to get away from his present annoying situation, and come to the old papal home. There is a marked difference between the church architecture of Spain and France. The former is grand, impressive, and very magnificent. The latter is usually gloomy, mean, and very unimpressive.

We could not quit Avignon without visiting the grave of Petrarch's Laura, within the enclosure of the old Museum, and over which some sentimental Englishman has placed a rustic marble cross.

The Paris and Mediterranean railway passes through Avignon, and Marseilles is reached in about three hours. Between the two cities the road runs through "Campus Lapideus," a plain of thousands of acres, covered with a mass of round pebbles. This is the spot, according to tradition, where Hercules fought the Ligurians. Having exhausted his arrows, Jupiter sent for his use a shower of stones. Some critic, however, has endeavored to spoil the story by saying that if Jupiter really intended to assist the son of Jove, he could have done so more effectually by showering the stones upon the heads of the Ligurians.

Just before reaching Marseilles, the railway passes through a tunnel three miles long, emerging from which the Mediterranean appears in view. Marseilles is a very enterprising, commercial city, but I must confess a dislike to commercial cities in Europe. They have a rough, business element about them, which shows itself in heavy trucks, carts, and other appliances of an active commerce, which jostles the romance of travel, especially after one has been buried for a time amid the antiquities of Spain, Nimes, and Avignon. Still, I feel bound to say that the city of Marseilles exceeded my preconceived notions. Its newer streets are usually broad and elegant, and in all Europe there is not another city which can boast of a drive to be compared with that along the Prado, through the Park and over the little Corniche, which rises above the Mediterranean and extends for three miles along the rocky face of the coast, until it reaches the noble harbor filled with vessels. The combination is very grand, and the view exceedingly fine, but travelers dislike long stays in a business place, and therefore from this point rush off to Nice, about six hours's ride by rail, where humanity in its varied forms of wasting disease and robust health, congregate. England, France, Russia, and ubiquitous America, all have their representatives, who eat, drink, sleep, dance, and sun, and declare that it is Elysium—though not exactly the heaven of the heathen. I confess that I like Nice. It is a sunny spot, happily situated upon the Mediterranean and sheltered on the land side side by the Alps Maratime, which carries the rough mistrale over head and into the sea, where it often lifts the water, and blows it about the surface like snow dancing upon the ice.

A few days spent in Nice only sharpens the desire to press on towards Italy, and the question arises by what way shall the trip be made? A tolerable steamer enables you to reach Genoa in about nine hours if the weather be good, but to go in that way one misses the famous "Corniche Road," to do which will require the best part of four days; but then it offers great advantages over the trip by sea, as it is unquestionably one of the grandest things to be seen in Europe. We decided in favor of the road, and having bargained with an Italian *Vetturini*, who had just come through from Genoa, we left Nice at noon and soon found ourselves slowly wending our way by zig zags up the sides of the mountains, having always in full view upon one side the snowy peaks of the Maritime Alps, and beneath, unrivalled Nice, with its surrounding olive groves and the Mediterranean stretching beyond the setting sun. Having gained the top of the mountain, we obtained a view of the picturesque village of Turbia, with its Roman ruins perched, like an eagle's nest, upon a ledge of rocks, and, thousands of feet below, upon a sharp promontory, jutting out into the sea, the famous little Principality of Monaco, resembling one of those modeled cities which are often seen in museums.

This miniature spot is a sort of political excresence upon the rocky headlands of France, and is entitled to the position it holds as the smallest independency in Europe. The Prince of Monaco claims his title by a long hereditary line reaching back to the tenth century, and although the town contains but 1,500 souls, the Prince has his grand palace, and is well well protected by fortifications of no mean pretensions. His Highness' chief source of income is derived from a gambling saloon, where fashionable gentlemen can go down twice a day from Nice to try their fortunes at *roulette* and *rouge et noir*, the boat returning as late as eleven o'clock at night, which enables them to make a long and usually very unprofitable day of it. I have heard it remarked that guests stopping at the hotel at Monaco are sometimes, in a polite way, informed that their room is considered better than their company if they do not patronize the games so graciously instituted for their benefit.

We passed our first night on the "Corniche" at Mentone, another of those very pleasant Mediterranean health ports, where invalids put in for balmy air and cheerful sunshine which are denied them in northern latitudes. The whole coast from Nice to Genoa is a succession of bold, rocky headlands, with intervening valleys and very picturesque old towns, the road being often cut in galleries along the side of the solid rock, sometimes running through tunnels under mountains, again across valleys, in full view of the sea, presenting to the traveler a constant and ever varying panorama of grand scenery; and what increases the interest very much, is the truly wonderful piece of railway engineering which was begun some years ago for the purpose of bringing Nice and Genoa nearer together.

The distance is 122 miles, and some idea may be formed of the magnitude of the work when it is known that there are upwards of 150 tunnels already made through the solid rock, besides many miles of causeway along the borders of the sea, protected by revetment walls to prevent washing. Some of the tunnels have caved in, and although millions have already been expended, the work seems to have stopped.

The Corniche road runs through the outskirts of the village of Bordighera, the spot where Ruffini has laid the scene of his story of Dr. Antonio—a most charming tale—which has added very much to the interest of this Riviera Province. Here the palm is extensively cultivated, and since the days of

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Sixtus V, Brodighera has had the special privilege of supplying St. Peters, at Rome, with palm leaves to be used in the Church ceremonies before Easter.

The road passes aronnd the walls of the ancient city of Albenga, the streets being too narrow to admit the safe passage of vehicles. The houses of these old towns along the road are usually very high, and the spaces between them, which serve as streets, more resemble deep rifts through a ledge of rocks. It was also curious to see heavy stone arches thrown overhead across the streets, from house to house, having the appearance of so many little foot bridges. But I understand that they were intended as safeguards against earthquakes, which, in former times, were frequent, unwelcome intruders.

Not far from Genoa we passed through the little seaport town of Coggoletto, which claims the honor of having been the birthplace of Christopher Columbus. The house wherein this great event took place, upward of four hundred years ago, is in a block on the main street, three stories high, having a rude fresco of Columbus, and the family shield, with an inscription painted upon its stuccoed front. The lower floor is now used for a very small grocery.

"To what base uses do we come at last!"

We reached Genoa toward evening of the fourth day of our trip, in the midst of a violent snow storm, which reminded us more of rough New England than of "soft, balmy Italy." We were informed that no such storm had occurred for a century. We stopped just long enough in Genoa to confirm what every body is supposed to know that it is a beautifully situated busy commercial city, of narrow streets and fine old palaces, usually magnificently fitted up. From Genoa we hastened on by carriage to the gulf of Spezzia. The trip occupied two days and surpasses the Corniche in beauty and varied scenery. Near to the top of the mountain above Sestri, where the road winds across a high promontory overlooking on either side a wide extent of land and sea, we were favored with one of those magnificent sights which are peculiar to the Mediterranean coast. Upon one hand we had a charming, and extensive view of deep valleys and green mountains, having their steep sides terraced up to form long narrow table lands for cultivation, overhung with the olive, ilex, the mulberry, and the vine, with here and there fine villas, plain stone cottages, and tall white campinales of churches rising gracefully above the foliage. Still higher up the mountains the dwarf pine, the myrtle, and other evergreens, now decked with snow. Upon the other hand, a broad sweep of the Mediterranean with a long stretch of beautifully indented coast, cheerful looking villages, and over the sea on one hand a heavy storm as clearly marked as if composed of so many silken cords suspended from the clouds; on the other hand the rays of sunlight, streaming through broken openings in the clouds, making the water look like a vast mirror of burnished gold, whilst beyond and nearer to the horizon we could discern the skeleton forms of ships appearing like the apparitions of so many goddesses of the sea, and above our heads, capping the summit of a mountain peak, a heavy snow cloud, into which we soon passed when we were enveloped in a heavy snow storm, and thus vanished from our sight a picture which the masters have never transferred to canvas. We are now at a hotel in Spezzia where Garabaldi was recently a prisoner under guard, and in sight of the finest harbor in Italy. S. H.W.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Nitro-Glycerin---Its Dangers and its Advantages.

MESSRS. EDITORS:---Permit me to offer a few suggestions in respect to nitro-glycerin since it is an agent so powerful in blasting rock that it is destined in a few years to play an important role in civil engineering; wherever the rock is exceedingly tough and the quantities to be removed are sufficient to permit its manufacture on the ground and pay for intelligent supervision, it will inevitably be largely used. Contractors and miners who study economy or who are under engagements to complete works within a limited period will resort to its use on account of its immense power and consequent economy, in spite of liability to accident. A brief review of some accidents that have been published, and the teachings to be gathered from them may not be out of place.

Discovered by an Italian chemist, A. Sobrero, in 1846, nearly eighteen years elapsed before it attained its present terrible notoriety in the United States; the accident in front of the Wyoming Hotel being the precursor of the slaughter of forty-five persons at Aspinwall, and six persons in the offices of Wells, Fargo & Co., at San Francisco. It is to be regretted that Alfred Nobel, the Swedish engineer, whose name is associated with its introduction to the United States, was not a chemist, since, had this been so, there is very little doubt but the fact of its tendency to decomposition at a temperature of from 110° to 130° Fah. in the presence of organic matter would have been discovered and guarded against, or at least not ignored, with so fearful a loss of human life.

The explosion at Aspinwall was a necessary sequence of shipping nitro-glycerin from a port (Hamburgh) where the temperature was at the time of shipment 55° to 60° Fah., to a tropical climate where the temperature was 110° to 120°, aggravated by the cases being confined in the hold of a steamship, the containing vessels being closed with cork. If the nitro-glycerin had not been thoroughly washed, the chemist will at once recognize in the above description elements certain to culminate in disaster.

The gases disengaged by the surging of the nitro-glycerin against the cork and decomposing it, would permit the nitro-glycerin to escape into the surrounding packing (sawdust). This would generate a new and easily ignited compound, and being mixed up with the undecomposed nitro-glycerin subjected to the rough handling of the stevedore's employés (a thermometer in the hold of the vessel probably would stand at not less than 180° in that climate), the sun pouring down the hatchways added to the radiation from the steam boilers and furnaces, an explosion would certainly occur. The use of it has undoubtedly been retarded by the above accidents, and the public have not been reassured by a vein of bravado which affects to pooh-pooh the possibility of an accident in its use. Your columns contain a statement of thousands of blasts having been performed without accident, of driving over roads with it at a rapid pace, but unfortunately these assertions were so speedily succeeded by an accident destroying eight persons accompanied by a mild censure of the coroner's jury on the person who made them, that less confidence than ever seems to be felt with regard to its use. Meanwhile, at Newcastle-on-Tyne, England, the sheriff and town surveyor with four other persons were hurried into eternity while engaged in burying some cases of this compound in a creep or crevice of an old pit the object being to remove it from the city and thus prevent accident.

The lesson to be derived from these accidents as I conceive for parties proposing to use nitro-glycerin is not to entirely rely upon the statements and assertions of others relative to the properties of the identical specimen they are about to handle, but with sober caution in every case verify for themselves, by experimenting with a few drops at a time the actual quality of the nitro-glycerin they are about operating with, for it differs in purity and liability to explosion.

It will be noticed that the principal accidents that have been published have occurred not to miners in their actual use of it for mining purposes but either in moving, transporting, or liquefying the compound when it had congealed, etc. In one case, however, a miner struck the rock that had been disturbed but not broken up by the blast to ascertain if it was rotten or solid (the nitro-glycerin had been poured into the drill hole without a cartridge); an explosion occurred from the blow on the distributed nitro-glycerin. Another case of a miner who for weeks previous to and at the time of the accident had been habitually drinking, using the magazine to store his bottle of whisky as well as the cans of nitro-glycerin and who, marvellous to relate, concealed his drunken habits from his employer. This case needs no comment; it is obvious a drunkard would be entirely unfit to have charge of a magazine whether containing nitro-glycerin or gunpowder. Instant dismissal of such a man, even if it stops the works, is an imperative duty in justice to his fellow miners.

There is one element of danger in manufacturing nitro-glycerin which will be overlooked by the tyro, viz., impurity of the acids used. It involves considerable care and skill to prepare concentrated nitric acid free from nitrous fumes, and if free when prepared, still exposure for a few minutes to the sun's rays, or any organic matter dropped in, causes decomposition; now if such acid be used, the washing (after the nitro-glycerin is produced) is so tedious, it must be continued so persistently, that few employés will give the labor requisite to ensure its thorough removal. Impure nitro-glycerin is the consequence, and, like a slow fuse, it is only a question of time how long it will take to reach the point of explosion. Manufactured where it is to be used, and used as soon after it is made as may be conveniently possible, avoids, however, this element of danger—less washing is then possible. Pure nitro-glycerin is colorless; a yellow tint indicates impurity, either of dentoxide azote, or iron contamination, caused by using iron vessels in the course of manufacture.

It may be purified by dissolving (very gradually) and at a low temperature not exceeding 50° Fah., in sulphuric acid and separating by the gradual addition of nitric acid always maintaining the temperature below 50° Fah., then pouring the mixed acids and nitro-glycerin in a fine stream, into at least five times their volume of cold water and thoroughly washing with distilled water the precipitated nitro-glycerin. The water used for washing should have its atmospheric air removed by boiling and then be allowed to cool. Condensed steam will answer. Printed assurances have been circulated that nitro-glycerin may be safely exposed to a temperature of 212°, that it may be stored for an indefinite time, without loss in weight or deterioration in quality; that it is insoluble in water, and that it is a fixed oil not subject to evaporation. In a limited sense, these assertions are true of a chemically pure nitro-glycerin; thus, under certain conditions, say at a temperature of from 50° to 60° Fah., pure nitro-glycerin entirely free from deutoxide azote and from organic matter may be stored for an indefinite time without deterioration. It is not vaporizable at ordinary temperatures but dropped on to a hot surface of soapstone it does evaporate and it is (sparingly) soluble in water.

But if commercial nitro-glycerin, as imported, be heated repeatedly in bulk from 110° to 130°, and then stored at 120° or thereabouts, an explosion will follow; the authority for this assertion is Prof. Abel, Supt. Laboratory, Woolwich Arsenal. An impression exists that in the congealed state it is more easily exploded than in the liquid form. I think otherwise. Fragments, the size of a bean, laid on a cold face and struck repeatedly with a cold steel hammer (temperature 28°) could not be exploded. Cartridges, 14 inches by 1¼ in diameter filled with nitro-glycerin and exposed to cold so as to solidify their contents were armed with a charge of powder a percussion cap containing 3 grains fulminating mercury (sporting caps only contain half-grain charges) and a fuse, were placed on ice and the fuse fired; the cap and powder exploded, the cap being driven four or five inches down into the solidified nitro-glycerin, the tin cartridge was split open, and the cylinder of frozen nitro-glycerin driven through the tin bottom of the cartridge. When a cartridge of liquid nitro-glycerin armed in a manner similar to the preceding was fired, explosion took place, firing at the same time the congealed nitro-glycerin that had missed exploding.

The conclusions I arrive at from the above observations are: 1. That nitro-glycerin will be largely used, owing to its great economy in mining, especially in very tough rock. 2. That the temptations to secure a profit regardless of a due sense of responsibility will tempt manufacturers to offer an impure article and unless this be carefully watched in magazine or speedily used great accidents will be apt to occur. 3. The miner should see that his nitro-glycerin is colorless and inodorous, if he stores it away; if it has a yellow tinge, emits bubbles, or gives off gases, or if on opening a can there is any indication of pressure and if on inhaling the air in the can there is a disagreeable or suffocating sensation in the trachea such nitro-glycerin is dangerous to store and should be used immediately or purified as previously directed. 4. That general statements relative to nitro-glycerin cannot be entirely trusted, for the reason that the writer may be describing either a pure, a comparatively pure, or an impure article, and remarks applicable to the pure article do not hold good as applied to a partially decomposed or decomposing nitro-glycerin.

GEO. M. MOWBRAY, West Shaft, Hoosac Tunnel.
North Adams, Mass.

Rotary Yokes and Bells.

MESSRS. EDITORS:—The practice of rotating bells for alleged security against breakage, by the use of any of the so-styled rotary yokes, in order to have the clapper strike on spots that may be changed and multiplied, until the entire inner circle of the sound bow-ring or a succession of spots in it is hammer-hardened and expanded, has no warrant in science or practical mechanics. All the particles adjacent to the hammer-hardened inner circle or succession of spots thus produced are subjected to a forced strain that impedes free vibration and weakens cohesion. Every considerable change of temperature, and all vibration producing sound from the bell increases this strain; sometimes both causes co-operate, and then as the disturbance of the particles is always greatest at the greatest diameter of the bell where the hammer-hardened spots or surfaces are made, and the forced strain exists, the danger of breakage is enhanced. It is well known that genuine bell metal composition in the form of a bell preserves the property of elasticity to that extent that the arrangement of the particles undergo no permanent change by any amount of vibration in ringing, only at the clapper spots. It is also known that bells have been in continuous use without breakage for a period as long as seven centuries with the clapper striking only on the two opposite spots. In all such cases, the clapper first wears a slight depression that is a counterpart of its form, at the spot where it strikes; the clapper and the spot conform to each other so completely after a time as to avoid all appearance of further wear. The spot is thus better suited to receive the impact of the clapper stroke and initiate the vibration which from thence pervades the whole mass of the bell without encountering condensed portions which would impede vibration by the partial immobility of the packed spots as will always be the case where there is a ring or a succession of spots hammer-hardened. A discussion of this question by a late commission at the Parlimentary Buildings in England tending adversely to the supposed benefits in the practice of swivelling bells in rotary yokes; and the collection of a number of facts and a number of broken bells that had actually been rotated, prompt these remarks.

J. C. M.

Cincinnati, Ohio.

Length of the Day---How to Make Plaster of Paris Harder.

MESSRS. EDITORS:—It has occurred to me that neither in the articles in your paper on "The Day Line" nor elsewhere have I seen the fact mentioned that the entire length of each day is 48 instead of 24 hours as always taught. Of course I mean its duration on the earth; not at any one place. I mention it because to all to whom I have spoken of it, it was a new idea, and it may be so to a great many others. I presume it is not necessary for me to explain how this is; as it will be evident on examination to those who have not before thought of it.

I also thought it might be worth while to say in relation to the question asked by "C. H. G., of Tenn.," No. 5, current volume, that I have experimented with plaster of Paris in the way of which he speaks, and, with one exception, have found all admixtures to impair the hardness of the plaster. The exception is iron filings. When these are mixed with plaster they rapidly oxidize, and the coherent mass of oxide of iron formed, adds its own strength to that of the plaster, making a very firm mass, which has also the advantage of strongly uniting itself to surfaces of iron. I have not observed what proportion of the filings is best, but suppose they should form about one fifth the whole weight. F. BOWLY.

Winchester, Va.

Remedy for Smoky Chimneys.

MESSRS. EDITORS:—May I communicate the result of my observation and reflection on some kinds of smoking chimneys, or such as have an imperfect draft? If a chimney is built near a wall or any other obstruction to the passage of the wind when it is blowing from the side on which the chimney is erected, the compression of the air in the vicinity of the wall is such that it will seek every crevice, stove-pipe and chimney through which to escape, thus producing a draft the wrong way. Remedy: Raise the vent of the chimney above the region of compressed air; or move it back or to one side, out of it. G. R. H.

Centralia, Mo.

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Heating Cars---A System of Telegraphic Signals.

MESSRS. EDITORS:—In your issue of Jan. 25th, a correspondent, referring to the *Angola* disaster, asks, "Would the flood of scalding water from the broken pipes have been any more merciful?" etc. He evidently has but crude notions of what is requisite in the application of water for warming cars. No huge tanks of boiling water, as may have been in his fancy, are required for this purpose.

To most comfortably warm every passenger in an ordinary railroad car requires but about a dozen gallons of *warm* (not *scalding*) water, circulating through a single pipe, of one and a half inches diameter, running along the sides of the car, and under each seat, so as to be in easy contact with the feet of every passenger.

This pipe being of very strong wrought iron, and firmly fastened, might be bent; but could hardly be broken by any railroad accident. Even were it to break, and the water "scalding," so small a quantity distributed over the entire floor space of the car could not possibly do any very serious injury.

A dull coal fire, strongly inclosed within a well-secured stove in one corner of the car, or under it, warms the water. In case of a "smash up," the probabilities are that the water, if let out, would protect the passengers by extinguishing the fire, rather than otherwise.

The above brief description is that of my arrangement now in use in cars running between New York and New Haven, and to Boston. I would add, that one of the indispensable requisites in this system is to have the circulating water prepared with salt, so that it cannot freeze when the fire goes out. No safer or "better plan" can be devised.

New York city. W. C. BAKER.

[Another correspondent recommends a stove made of boiler iron, with the openings guarded by dampers and doors to prevent the escape of fire in whatever position the stove may be placed by the overturning of the car. He sends a diagram of a safety stove, which appears to be well designed for the purpose.

For safety from collisions, a correspondent advises that every train, upon arriving at a depot, should be signalled to the next station that it will pass, and not be allowed to leave until an answer is returned, stating that the track is clear; and when again started, the signal of "started" should be again sent forward, so that the train may be expected, and the track kept clear; and in no case should a train be allowed to pass a station, and follow upon the track of a preceding one, until the other shall have reached the next station, and the proper signal have been returned. The same plan should also be adopted with the through express and freight trains passing depots without stopping, so that the ordinary signals now in use may be regulated by these telegraphic messages, which could be modified by using the simple signals of "In" and "Out." When the train has arrived, the message "In" should be used, and when the train has started, "Out" should be employed; and in the event of allowing a train to go past a station at which there may be a train standing, or switched, the signal of "Caution" might be added to the list, and the train would then proceed slowly; also, in the case of an accident between the stations, the very non-arrival of the train in due time, after being signalled as having left the preceding station, would cause an immediate inquiry, and would prevent the following train from running indiscriminately upon it, which is only too often the case.

Tar and Resin Compounds.

Compositions having tar and resin for the basis are almost endless, and so are the patents for them. Almost any simple mixture of these substances, which any one may make, will possess excellent qualities. A recent patent, by Louis Harmyer, of Cincinnati, O., contains the following:—

"This composition is composed of tar, resin, sulphuric acid, copperas, salt, alum, lime, and carbon iron. These articles I compound in the following manner: Take one barrel of tar and boil it for half an hour; then take 10 lbs. pulverized resin, mix with the tar, and boil until the resin is dissolved: then mix carefully with the tar and resin 2½ lbs. of sulphuric acid; then add and mix 10 lbs. of pulverized copperas, 6 lbs salt, 6 lbs. pulverized alum, 60 lbs. lime, and 2 lbs. carbon iron, and the composition is complete.

"This composition is of value for the preservation of wood, metal, canvas, leather, paper, etc., and mixed with another composition, hereinafter described, may be used as a pavement for streets and walks.

"Blocks or pieces of wood, or wooden structures, are benefitted by the use of this composition. The blocks should be saturated with hot composition. Where that cannot well be done, the composition may be put upon blocks, and upon structures, warm, with a brush. On metal, it should be put on in a warm day, or better, in a warm room, with a brush. Canvas may be soaked in it for a few minutes, then rolled and dried. Leather may be painted with it warm. Better to soak it, say for fifteen minutes in warm composition, then rolled and dried in a warm room, and rubbed with rags. Paper and pasteboards for roofing, or for many other purposes, should be saturated with hot composition, and then rolled through rollers. Brick and stone may be soaked in hot composition, or the hot composition may be put on with a brush, etc.

"This composition makes wood water proof and air tight. On metal roofing it is proof against the corroding effects of rain and atmospheric changes. It renders canvas water proof. So also of leather, paper, and pasteboard, and for roofing with paper, is superior to any composition in use.

"For a pavement the composition should be made hot. Then to one barrel of composition add one and a half barrel of pulverized resin, one and a half barrel of lime, and dry fine gravel enough to make it nearly a dry substance. Then put it down hot, and put marble dust upon it.

"To make sealing wax, take one compound of composition, make it hot, and add two pounds of pulverized resin and half a pound of pulverized chalk."

Science Familiarly Illustrated.

HEAT AND COLD.

BY JOHN TYNDALL, ESQ., LL. D., FRS.

Lecture III.

In the last lecture I showed you the change which takes place in water when it is gradually cooled; and I showed you in a very striking manner that water when it freezes and becomes ice, expands, and that the force of the expansion is so great as to burst the bombshell which was placed before you in the last lecture. Now follow me for a moment, please. Conceive water at the ordinary temperature; conceive it growing gradually colder and colder. Like almost all other bodies it becomes smaller and smaller; it shrinks as it becomes colder; but at a certain point, and some time before it turns into ice, it leaves off contracting. Suppose the water to go down from a temperature of 60°; it continues contracting until it reaches the temperature of 39° Fahr., or 4° Centigrade; and then the water instantly ceases to contract, and 7° F. before it becomes solid it begins to expand as it becomes colder. What is the consequence of this expansion? The water from 39° Fahr. downwards becomes lighter, and it swims like oil over the surface of the water underneath, and there it is frozen; and when it freezes, when it passes from the liquid state to the solid state, a sudden and very great expansion occurs, so that eight volumes of water weigh about as much as nine volumes of ice, the ice being the lighter of the two, and therefore swimming upon the water.

I must ask you now to accompany me for a moment to some of the things that occur in nature in connection with this subject of heat. You know that at certain parts of the earth's surface the heat is very much more powerful than it is here in England; and you know that the reason for this is that at certain parts of the earth's surface the sun is overhead, and its rays come vertically downwards, and thus heat very much the surface of the earth directly underneath the sun. In the region of what is called the Equator we know that the sun is directly above the heads of the people living there, and at certain distances each side of it. Now, imagine this sun pouring down its heat through the atmosphere upon the sea. The surface of the sea is thereby warmed, a quantity of vapor is produced, and that vapor ascends with the air into the higher regions. When the surface of the earth at the Equator is heated, the air also at that point becomes heated, and rises, as the air of this room rose from the surface of that heated spatula, in the last lecture. When the air at the Equator is heated by the sun, part of it goes toward the North Pole and part of it toward the South Pole, while underneath air rushes in from the other directions to supply the place of the air which goes to the north and south. If you could see the air you would see it going one way and coming back another. A continuous circulation is thus going on, and the winds that are produced in this way have a particular name given them. They are called the "trade winds." The current above is called the "upper trade wind," and the current beneath is called the "lower trade wind." Now, as I have said, when the sun's rays act upon the ocean they convert its water into vapor, and this vapor is carried up into the air. What is the consequence? I want to show you one or two facts that will enable you to understand what must occur.

The first fact that I wish to show you is, that if we compress air suddenly we develope heat; and I do this by means of the syringe that I have here. This is a small (Fig. 1) glass tube bored very carefully, and furnished with a piston that fits air tight into that glass tube; so that if I squeeze this piston down I compress the air underneath it. Now, here I have a piece of German tinder, which I place in a little cavity made at the bottom of the piston; and I think I shall be able to ignite that German tinder by forcing down the piston and thus compressing the air. [The tinder was ignited as described.] Now, what we have done here is, indeed, nothing more than simply throwing the atoms (as we have agreed to call them) of the air into this intense state of vibration which we call heat. On the other hand, if we take a body having a certain amount of heat, and, instead of compressing the air, allow it to expand, then the expansion of the air produces cold. I will show you one effect of this expansion of air. I have here condensed in this vessel, forced in by a kind of syringe, a great deal more air than the vessel would contain naturally; and if I were simply to turn this cock, and allow the air to issue from the vessel against an air thermometer, I should produce an effect which would, perhaps, be visible to my young friends immediately before me. If cold is produced in this way the column will rise a little. I will now turn this air out against the thermometer. The column has risen a little, which proves that the air which has come out of this vessel, and become expanded, has become chilled.

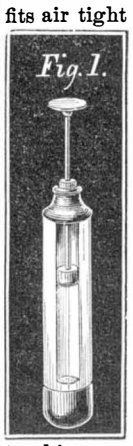
Fig. 1.

A great man who used to lecture in this room many years ago, Sir Humphrey Davy, described a machine which he saw at Schemnitz in Hungary, formed so as to allow a very strong current of compressed air to issue from it, and the amount of cold produced by the expansion of the air was such as to cause the vapor of the atmosphere to condense and congeal, and form icicles. Now I want you to remember that when air is condensed in the way I have described heat is developed, and that when an expansion of the air takes place an opposite effect is produced. Mr. Cottrell has here arranged a little experiment, but as I do not know whether it will be visible or not to you all, I will tell you what it is. This glass receiver contains air, and within it is a small elastic balloon, which also contains air. The air which the balloon has within it has a certain amount of heat, and in virtue of that heat it has a certain power of squeezing out the sides of the balloon. If we now pump the air out of the outer vessel, and so remove the air from the outside of the balloon, we take away the force which counteracts the force inside this balloon. It will then expand and almost fill the entire vessel. [The air was then exhausted by means of an air pump.] You see the balloon becomes larger and larger. You see it growing visibly before you, and the air within this balloon at the present time is being chilled because of its expansion. The assistant will go on pumping out the air from the glass receiver, and after a time the balloon will almost fill the receiver. It thus goes on swelling and swelling, the air within it expanding, and this air, by the act of expansion, becomes chilled. We will now allow the air to enter by turning this cock, and then the balloon will shrink to its first dimensions. See how small it becomes, because we get a pressure on the outside of the balloon, squeezing it inwards, until now it is finally reduced to the same size that it had at the commencement. Mr. Cottrell will now remove that balloon altogether, as I want to show you what takes place within that receiver when the air is thus taken out of it. I want to show you the effect of the chilling produced by the rarefaction or expansion of the air in nature. But first I will tell you the effect produced on a body of air rising, we will say, from the surface of the sea to a certain hight above it. We will take a definite hight, such as we often find in the Alps—11,000 feet, the hight of one of the higher Alpine passes. Conceive, then, a body of air rushing up the mountain, and going to the top of that pass. In climbing up this 11,000 feet the air gets into a place where it is not so much pressed upon as it was below. A portion of the atmosphere has been removed from above it, and the consequence is that the rising air expands, and the expansion is followed by a lowering of its temperature. The air becomes colder, and if it had in it as much moisture as it could hold, it would, in rising 11,000 feet, fall very nearly 50° Fahrenheit in temperature.

Now, you must remember that in order to preserve the vapor of this room in an invisible state, a certain temperature is necessary. If you could at this moment introduce into this room the temperature of the polar regions, what would you obtain? First, the air of the room would thicken so as to form a fog, and then that air would be chilled and fall as snow. Even in London ball-rooms this may sometimes be observed. When the windows have been opened in the intervals of the dances, the air has immediately become cooled, and a condensation of the vapor has taken place sufficient to make the atmosphere dim. Now imagine air charged with this invisible vapor being carried up one of these high Alpine passes. If in this way it gets its temperature reduced to 32°, the air can no longer hold its vapor, that vapor then falls as snow, and that snow is deposited on the tops of the mountains.

I want now to show you how clouds are formed by the condensation of vapor. Here we have the receiver of our air-pump, enclosing a quantity of air which is charged with invisible aqueous vapor. Mr. Chapman will now place a lamp behind this glass receiver. I will send a beam of light through the receiver, and let it fall on the screen. At first you will not see any appearance of auything inside the receiver. I will then ask Mr. Cottrell to work the air-pump, and exhaust some of the air, and thus cause the remaining air to expand. This will reduce its temperature, and then you will see that the vapor within the receiver will become a fog. You now see no sign of anything within the receiver; but we will now exhaust the air. [The air-pump was then put in action, and a condensation of the vapor became immediately manifest.]

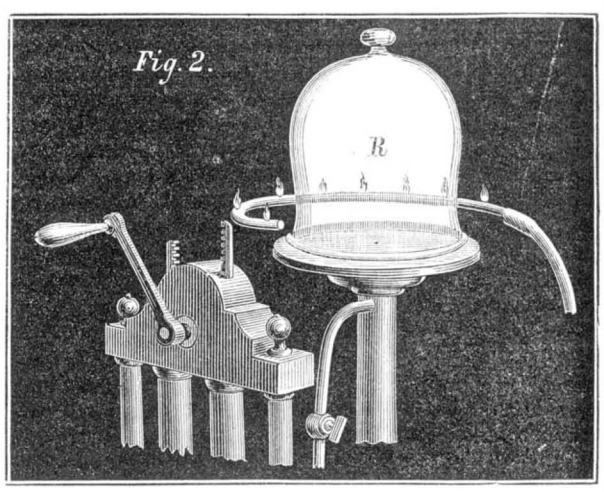

Fig. 2.

You see a cloud has now formed in the receiver, and when the air is allowed to reënter it causes the cloud to go entirely away, although the vapor itself is still there. We will work the pump again, and you will see that the cloud is again formed, and will be again illuminated by the light from the lamp. There it is. That is a true cloud which is formed in this way from the air of the room, and it is in this way that clouds are formed in the atmosphere by the expansion and consequent cooling of the air which rises from the surface of the sea.

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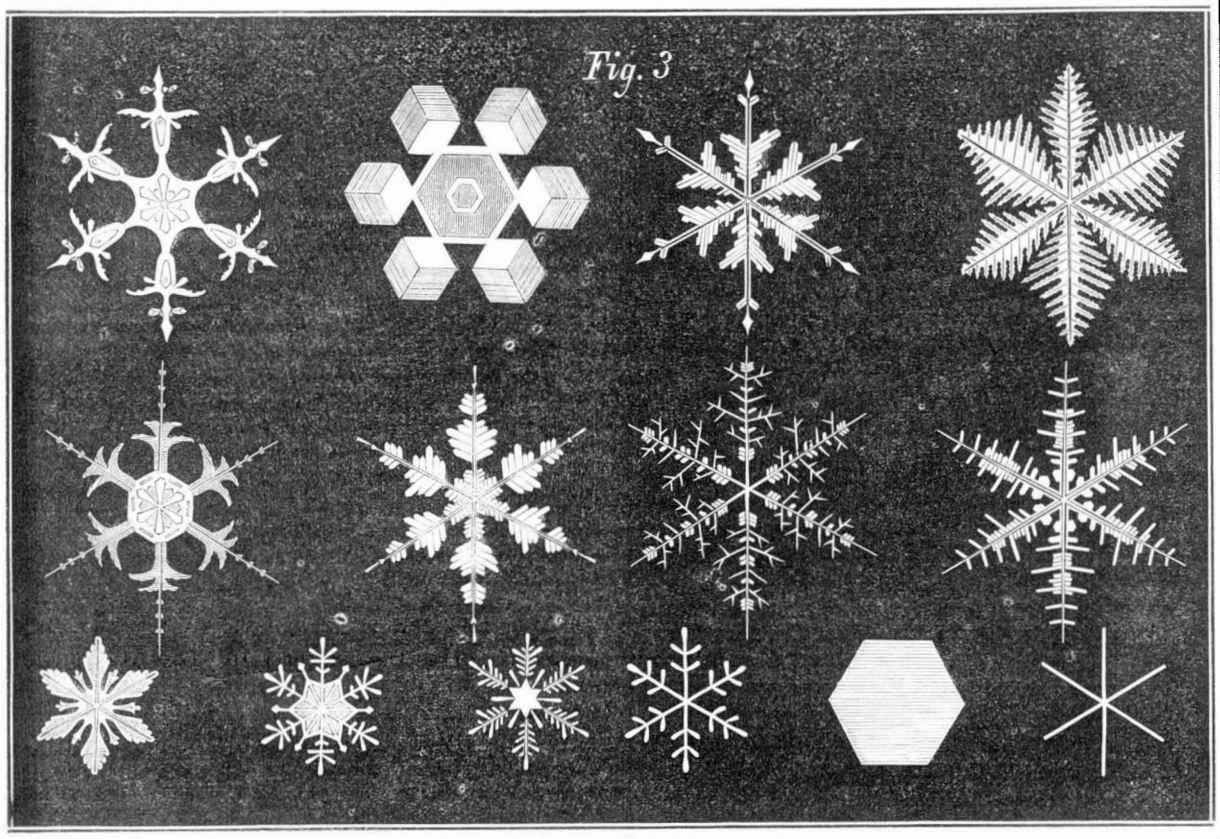
These clouds may fall as rain, but as I have said, they may also fall as snow. I suppose that snow is such a familiar thing to every boy and girl here present, that it may seem to be hardly worth thinking about; but still this substance is one of the most wonderful and beautiful things in the whole world; and when snow is formed in a very still atmosphere, as I have often had the pleasure of seeing it formed in the Alps, it takes the form of those beautiful figures which are represented in the diagram yonder. (Fig. 3.)



It forms as small, six-rayed stars. This is the form of the snow which goes on loading the Alpine mountains year after year; and when we look at these mountains, and at the valleys connected with them, we find that the most wonderful series of appearances presents itself. On very closely observing the snow upon the Alpine slopes, we find that it is in a state of motion. We find that the snow has been incessantly moving down the Alpine slopes into the valleys; and hence we have the valleys filled with rivers of ice. On standing for the first time beside one of these rivers of ice, you would imagine that it was perfectly motionless, and that a body so rigid as ice could not move at all; but when you make proper observations, you find that the ice is perpetually moving down, and thus we have these glaciers of the Alps. I have no doubt that every boy here will one day visit those glaciers for himself. I have here a sketch of one of the most famous of those glaciers. It is called the "Mer de Glace," and is situated near Chamounix. This Mer de Glace has its great feeders from the snows that fall upon Mont Blanc and the series of mountains which are rudely sketched in this diagram. Here is a great cascade where the snow, after being half consolidated—squeezed together so as to form ice—actually moves down, forming a cascade of ice which comes along this valley. Here is another basin where the snows collect, and where its particles are squeezed into ice, and you have this ice also always in a state of motion.

Now let us look at the lines which I have drawn on the diagram. The mountains beside the glaciers are always sending down stones and dirt, and consequently you always have lines of dirt carried down; and you see that where two glaciers have their sides turning and uniting as here shown, they form a line along the middle of the trunk of the glacier. Now these lines which I have mentioned are called *moraines*. Those at the side are called *lateral moraines*, and those in the middle are called *medial moraines*. We have in the Mer de Glace these three moraines. If we examine this glacier we find that notwithstanding the rigidity of ice it moves down like a river. Eminent men have worked at this subject; Saussure worked at it a little, not much, and was followed by Bordier, who observed that ice behaved almost like a viscous body. He was the first to propound the fact that ice was of this character. He was fellowed by Rendu, who also took up the idea that ice behaved like a viscous body, such as honey, treacle, or tar, or paste. Then he was followed by Mr. Agassiz, and another, and they determined the velocity with which this ice falls. Then came Principal Forbes, an eminent Scotchman, and his measurements pushed the question far beyond its former stage. And then came Mr. Huxley and myself; and we pushed the matter a little forward; and afterwards I did a little on my own account in reference to this question. It is in this way that scientific knowledge is accumulated. It goes rolling on and becoming bigger like a snow-ball, and thus it is that science grows and has grown to what it is at the present day.

A Transcript from Old Records.

From "Morse's Gazetteer," published in 1797, we take the following relating to New York city:

"The city was incorporated in 1696. It is two miles in length and one mile in breadth. Its population in 1756 was 11,000; in 1771, 22,000; in 1786, 24,000; in 1796, 70,000.

"From the gallery in front of Federal Hall, at the head of Broad street, George Washington took the oath of office as President of the United States, April 30, 1789.

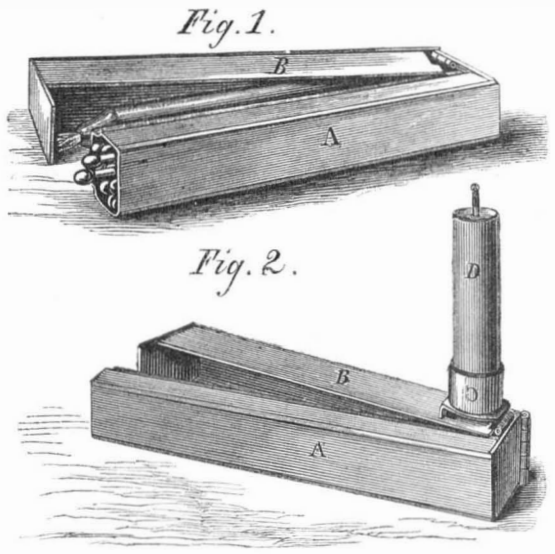
"The supply of water is insufficient, and many of the inhabitants are provided from a well at the head of Queen street, from which the quantity of 110 hogsheads, or 14,400 gallons is daily drawn, and on some hot days the amount of 216 hogsheads. The well is but 20 feet in depth, and holds but three feet of water, which is sold at three pence per hogshead."

From the same work, under the head of "Mingo Town," Pa.: "In this vicinity are some springs which yield 'Petrel,' a bituminous fluid." [The "coal oil" which so universally dispels the darkness of 1868.—ED. SC. AM.]

And from the same work, under the head of "Territory"—relating to the Northwest Territory of the United States—is taken the following prediction, made eleven years previously to the passage of Robert Fulton up the Hudson river in a steamboat: "It is probable that steamboats will be found to do infinite service in all our extensive river navigation."

WHIPPLE'S COMBINED TAPER HOLDER AND MATCH SAFE.

The object of this invention is to furnish a ready means of providing a light on occasions when an ordinary lamp might not be accessible or convenient to carry about. For this purpose the little device shown in the engravings is admirably adapted, being neat, handy, and so small as to be readily carried in the vest pocket. Larger sizes for ordinary candles



are also made. It will prove of great advantage to parties camping out, to mechanics at work in dark places, hunters, frontier's men, and convenient for Christmas tapers. It was patented in the United States, May 28, 1867, by John A. Whipple, 297 Washington street, Boston, Mass. It is also the subject of several foreign patents.

The case proper is in two parts, hinged, and formed of sheet metal. One compartment, A, is the match receptacle; and the other, B, a case or box for its reception. Hinged to the end of the match safe is a socket, C, for holding an ordinary candle or a miniature candle, or taper, D. When closed the contrivance is simply a rectangular box, being, for the small size, about three quarters of an inch square by three-and-a-half inches long. When opened the taper and its socket stands on one end of the case, and the case is a handle and standard for the light.

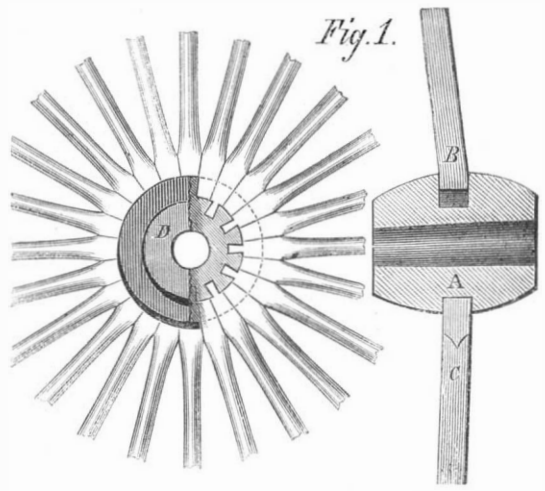
The foregoing is sufficient to give the reader a correct idea of this eminently handy and useful device. All orders and other communications should be addressed to the patentee, as above.

ANY subscriber who fails to get his paper regularly or has not received all the numbers of this volume is desired to inform the publishers by mail; missing numbers will be supplied.

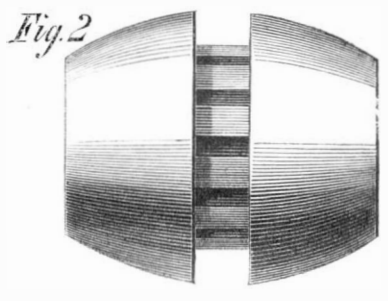
SAWYER'S PATENT CARRIAGE WHEEL.

One great difficulty experienced by carriage makers in constructing a strong and elegant wheel is the necessity of cutting away in mortises so large a proportion of the hub as to greatly weaken this important and central part. The design of the improvement shown in the engraving is to retain the largest number of spokes in a wheel, while the hub shall not be weakened by cutting away the most of its interior in mortising.

In this invention only every alternate spoke is mortised, the others, or supplementary spokes, acting as keys or wedges, yet being firmly held in place by their contact with the other spokes, and with the shoulders or rims on the hub. The hub has a circumferential groove—Fig. 2—turned in it of sufficient width and depth to receive the ends of the supplemental spokes. At the bottom of this groove the mortises for the true spokes are cut, which are seated in the usual manner, they, with the auxiliary spokes, making a solid continuation of the wheel hub, the whole being thus securely locked and fastened.



A, in the engraving, Fig. 1, is a section of the hub. B, a



section of the true spoke showing the tenon, and C, the supplementary spoke, seated in the circumferential recess. The figure marked D, shows the wheel as constructed, the dotted lines on one side denoting the periphery of the hub.

Instead of cutting a score or recess in the hub, it may be made quite small, and two strong bands or flanges of iron or other metal may be shrunk on, or otherwise secured to the hub, their inner surfaces forming the recess or groove which will secure the spokes firmly in place. By means of these bands, wheels already in use may be strengthened by the introduction of supplementary spokes, without diminishing the strength of the hub by increasing the number of mortises. This device applies to wheels, the hubs, spokes, and fellies of which may be made of metal, as well as those which are composed of wood.

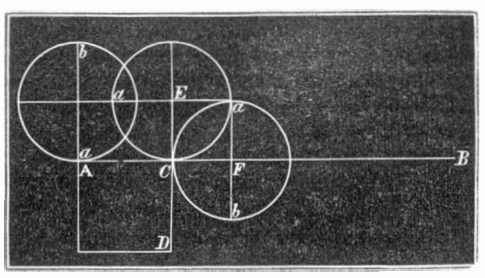
Practical wheelwrights, and others, will readily see the advantages of this mode of constructing wheels. It was patented through the Scientific American Patent Agency, Oct. 22, 1867, by W. T. Sawyer, Whistler, Mobile Co., Ala., whom address for further information.

THE MOVABLE WHEEL QUESTION.

"How many revolutions on its own axis will a movable wheel make in rolling once around a fixed wheel of the same diameter?" [Original question.]

We are in continued receipt of many communications upon the subject, but are obliged this week to curtail our selections. We shall return to the subject next week.

MESSRS EDITORS:—You say that a wheel in revolving around a fixed wheel of the same size makes but one revolution on its axis. You say that L. M., by the diagram given, proves himself wrong. I beg leave to disagree with you, and think the following sketch will make it appear that the wheel does make two revolutions:



If the line, A B, is equal to the circumference of the wheel in revolving from A to B, the wheel will make one revolution, but if A B be bent into a square then the wheel will make two revolutions in passing round it.

Suppose the wheel starts at A, in going from A to C, one-fourth of the distance, A B, the wheel would make one-fourth of a revolution; now before the wheel can advance on the line

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C D, the point at C must remain stationary while the center, E, moves round to the point, F, making another quarter of a revolution. One half a revolution is made on one side of the square, or rather one side and at one angle. If the square be changed into a polygon of an infinite number of sides, or a circle, the case will not be changed. A. C. SEKELL.

Boston, Mass.

As the rolling wheel, in making one revolution upon its own axis, moves over a distance equal to its circumference, which is designated A B by the above correspondent, the distance traversed by the wheel in making a revolution upon its own axis will be the same whether the path traversed be curved or rectilinear. If the wheel made two revolutions upon its axis, the distance traversed by it would be twice A B.

MESSRS. EDITORS:—Allow me to give my theory of the solution of the question of "How many revolutions will a wheel make on its own axis in going once round a fixed wheel of the same size?" I do not profess to be much of a mechanic but I think I have the solution. I took two ordinary cotton spools and put a shaft through one of them, then marked both the spools off into quadrants. I also marked the end of the axis, then held the axis firm and rolled that spool round the other one. I found, by observing the marks on the end of the axis and also the marks on the face of the spools, that there were *apparently* two revolutions on the axis, while there was only one on the circumference, and then by a little consideration I found that the axis itself had made one revolution in an opposite direction from the spool, because in going all round it had presented all its sides to the surface of the fixed wheel, thus making the two *apparent* revolutions while in reality there was only one revolution of the wheel. This is easily undertood when it is considered that the circle the axis describes in going round the fixed wheel is just twice as large as the surface of the fixed wheel, consequently it is necessary that it should show two revolutions while in reality making only one. J. B.

Philadelphia, Pa.

Advice to Young Mechanics.

In referring to the growing inclination on the part of young men, after they have served long and hard apprenticeships to acquire a good trade, to abandon that mode of making a living and to enter the legal or medical profession, where it is supposed greater emoluments can be secured and larger honors won, a cotemporary well observes that nineteen cases out of twenty such ventures are failnres, for two reasons. First, the professions require peculiar talent and the most thorough education. As a rule, apprentices to the trades have neither the time nor the means to acquire this education. Hence, when a mechanic at the end of his apprenticeship aspires to and enters any one of the professions he does so at a great disadvantage. He may be a fluent speaker, know how to argue a point in a debating society or harangue a crowd at a ward meeting, but such talents do not fit him for the legal profession. He may know how to extract a splinter from his own hand, how to make a salve, how to mix a powder or administer a pill, but all this, while it might qualify him as a good nurse, does not fit him for the medical profession. The fact is, the young men who abandon their trades are tempted to do so by a feeling of false pride, erroneously imagining there is no honor to be secured in a pursuit of the mechanical arts. History proves the fallacy of such suppositions.

The brightest names which now adorn the annals of all countries are of the best mechanics who have blessed mankind with the productions of their genius. All that is beauiful and grand is the result of improvement in mechanics. The pendulum, the main-spring, the barometer, thermometer, printing press, steam engine, locomotive, sewing machine, telescope—all, all are the result of mechanics' arts, making those famous who produced them, and the people great who adopted them.

A good mechanic who becomes a pettifogger or quack, merely because he is too proud to work at his trade, is, indeed, a pitiful object. A man of the right mental balance, who has proper mental form, with the necessary independence, will win as much honor and as fair a living in the trades as in the professions; indeed an indifferent lawyer or doctor lacking briefs or patients, is always a miserable being, a bad example in the community. Let our young mechanics, then, become ambitious in their own peculiar vocations. If they dignify their trades by becoming proficient therein, the trades will dignify them with the highest honors. If mechanics pursue their business with a purpose to self-improvement therein, and not merely to hammer and file and saw, but to improve the art, to develope something new therein, the mind will be strengthened as the arm becomes muscular, and the heart of the mechanic will be made to swell with as true a pride as ever glowed beneath the doublet of a prince. Will the young mechanic think of these truths?

Walking and its Uses.

Dr. A. L. Wood, in the *Herald of Health*, gives the following sensible advice on walking.

Exercise is absolutely indispensable to the physical well-being of man, and walking is one of the most useful of the various modes of exercise. As a people we ride too much and walk too little. If we are in the country, and have a mile or two to go, we wait—perhaps long enough to walk the entire distance—for a horse to be got ready, and then sit lazily in our seats while this noble animal rapidly carries us to our destination. If we are in the city, and have a few blocks to go, we get into an omnibus or a horse car and sit our journey out, just as though we were not created with legs the same as horses are. The nation's legs are rapidly diminishing in size for the want of exercise, hence the demand for false calves and for easier modes of locomotion is on the increase; so, also, is dyspepsia, liver complaint, general debility, and other physical derangements, which result, in great part at least, from a lack of muscular action.

The special advantages of walking, as an exercise, are many. Perhaps the most important is that it takes us out of doors, and keeps us there in the pure air and the bright sunshine. The exercise, which is gentle and prolonged, increases not only the frequency but the fulness of respiration, thus bringing a much larger quantity of oxygen into the lungs and through them, to the blood, thereby giving the finishing touch to the process of digestion and vitalizing "the red current of life." Another advantage to respiration is this: when a person is sitting or standing still, the exhaled air from the lungs, which is unfit to be breathed again, fills the space about the face, and a portion of it is taken into the lungs at the next breath; especially is this the case if the head is bent forward; but when a person is walking and expels the air from his lungs, his head is carried past the expired air before he draws in another breath, and thus he gets a supply of pure air, with its full proportion of oxygen, at every inspiration, and thus is the vigor and vivacity which results from exercise in the open air partially accounted for. Walking is very beneficial to the digestive organs, by the gentle yet constant motion which it imparts to them, and which is essential to their long-continued, healthful action. It brings into action and properly develops more muscles than any other one mode of exercise. It tends to equalize the circulation of the blood. Pedestrians, rope-dancers, and those who exercise their legs a great deal are not troubled with that almost universal complaint—cold feet. The simple reason is that exercise calls the blood to the parts exercised, and the blood feeds and warms.

One great objection to walking is that it takes so much time. True, it takes some time; more, as a general thing, than it does to ride; but so does the accomplishment of any thing desirable; and is not good health desirable? In the end, however, it results in the saving of time, by preserving the health and increasing the vigor of all the physical and mental functions. In no way is there so much time wasted, to say nothing of vitality, as in being sick, and yet people are unwilling to give a little time to keeping well.

To obtain the greatest amount of good from walking, it must, like every thing else, be done right. In the first place, it is always best to have some definite object in view when going out to walk, some particular place or object of interest to see, some purpose to accomplish, or some friend to visit, and not walk merely for the purpose of walking, if any other object can be attained at the same time. But better walk without any other object than not walk at all. The position of the body while walking is of great importance. The body should incline slightly forward from the hips, if walking slowly, and the inclination should increase according to the rapidity of the walk. The head should be kept on a line with the body, the shoulders and hips held back, and the chest unimpeded in its action by tight clothing or otherwise. The arms should be allowed to swing freely at the side. The respiration should be carried on entirely through the nostrils, and not through the mouth. In commencing a long walk, walk slowly at first, and gradually increase the speed. Invalids, and persons who are unaccustomed to walking, should begin with short walks, being careful not to overdo, and increase the distance as their strength and endurance increase. Any one who will practise this precept—never ride when you can just as well walk—will not only be more vigorous and healthy, but will accomplish far more than he or she otherwise would.

Absorption of Gases by Solids.

Among the interesting observations of Mr. Graham, Master of the British Mint, upon the passage of liquids and gases through solids, is the fact that atmospheric air, by passing through india-rubber, becomes super-oxigenated, and will rekindle smoldering wood like pure oxygen. Any kind of light india-rubber receiver, in which a vacuum may be obtained, the size being sustained by mechanical means, will collect super-oxigenated air; the better if the india-rubber be thin and the temperature high. Mr. Graham makes the suggestion that the solid films pass gases through them by first condensing them to a liquid form within the substance, and then passing them off on the other side by evaporation. Hydrogen pases through red-hot platinum, while oxygen and nitrogen do not, or not in appreciable qualities; hence their compounds with hydrogen are readily dialyzed by this method. The passage of carbonic acid, chlorine, hydro-chloric acid, vapor of water, ammonia, coal gas, and hydro-sulphuric acid, is also inappreciable, while the hydrogen, in compounds containing it, passes. One volume of red hot platinum absorbed 0·207 volume of hydrogen, retained in while cold, and gave it off on reheating. One volume of palladium absorbed 643 volumes of hydrogen, sensibly increasing its weight, and when heated afterward, gave off the most of it in a continuous stream. On the other hand, osmium-iridium does not absorb hydrogen, and copper absorbs it very slightly. Gold absorbs hydrogen and nitrogen slightly. Silver absorbs 0·289 of its volume of hydrogen, and then presents a beautifully frosted appearance. Oxygen is taken up in the proportion of 0·745. Red-hot iron and steel pass hydrogen as readily as platinum does.

Notice to Correspondents.

In consequence of a derangement of water pipes our editorial rooms were flooded a few days ago and a large quantity of correspondence and MSS. destroyed. Correspondents who fail to receive a response to their communications will please write again.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

LOOSE PULLEYS, GEAR WHEELS, ETC.—George M. Morris and John McCreary, Cohoes, N. Y.—This invention relates to a new manner of forming the recesses, channels, or grooves in the hubs of loose pulleys, gear or other wheels, or in the bushings fitted into their hubs.

BRUSH.—William W. Clark, New York city.—This invention consists in so forming brushes used for painting, varnishing, and other purposes, that the bristles which form the brush are rendered more elastic and the brush more durable than when they are put together in the ordinary manner.

SAW HOOD.—C. D. Blakeslee, Grand Rapids, Mich.—This iuvention relates to an improved saw hood and consists of an adju table guard on which the hood is hung of peculiar form protecting every part of the saw except where the lumber is fed to the saw.

CONSTRUCTING MOLASSES CUPS.—Griffen B. Halsted, New York city.—This iuvention consists in constructing the cup of tinned iron plates swaged or struck up in two vertical equal parts or halves, the edges of the swaged parts being trimmed and then united together by soldering. The feet, knob, lid, and handle, being afterward applied or attached.

PAWL AND RATCHET ATTACHMENT FOR THE NUTS OF SCREW BOLTS.—D. Elliot and E. Seely, New York city.—This invention relates to a pawl and ratchet attachment for the nuts of screw bolts whereby the nuts are prevented from casually loosening or becoming unscrewed. The invention consists in a novel manner of constructing the pawl on the washer of the bolt and in forming the ratchet on the nut, whereby a very economical device for the purpose specified is obtained.

NAIL PLATE FEEDER.—Cyrus D. Hunt, Fair Haven, Mass.—This invention relates to a new and useful improvement in feeding apparatus for turning or reversing and feeding nail plates in a nail-cutting machine automatically.

BRACE FOR CARRIAGE HOODS.—Moses Powe, Belvedere, N. J.—This invention relates to the joint of the brace of carriage tops or hoods and consists of a rigid metallic sheath lapping on three sides of the joint when the hood is raised.

HAND TRUCK.—Wm. May, Binghamton, N. Y.—This invention relates to a hand truck which is so arranged that it can easily take hold of boxes, packages. etc., and that it can be readily handled.

PISTOL AIM HOLDER.—Fisher A. Spofford and Mathew G. Raffington, Columbus, Ohio.—This invention relates to a device for holding the aim during shooting practice with toy guns and pistols and for retaining the same when it has been hit, also for retaining the balls or marbles ejected from the guns or pistols.

MACHINE FOR FORMING SHEET-METAL MOLDINGS.—Valentine Fischer, New York city.—This invention relates to a new machine for pressing moldings for cornices, etc., from galvanized or other sheet metal and consists in so arranging the machine that butt wo kinds of dies for all kinds of smooth moldings that may have to be formed are needed, viz., rounded and square dies. Of the latter but one set is required for making all sorts of angles while of the rounded dies as many sets must be provided as there are different-sized curves to be represented in the moldings.

SKATE.—Alfred Woodham, New York city.—The present invention relates to the fastening of skates to the boot or shoe sole, and to that class of fastenings which sieze the boot or shoe sole upon its sides and heel; the invention consisting in a novel arrangement of such side clamps upon the foot rest of the skate and in their connection together at corresponding points upon each side of the skate whereby a fastening is produced of most simple form and in its construction practical and not liable to become disarranged or to break from use and wear.

SLIDING PEN HOLDER.—C. M. H. Warren, Brooklyn, N. Y.—This invention relates to a pen holder of that class in which the pen is allowed to slide so that its point may be protected in case of the dropping of the pen and holder upon the floor. The object of the invention is to obtain a very simple, economical and portable pen holder which will answer equally as well as the expensive telescopic holders now in very general use.

BUTTER WORKER.—Henry Garrett, Richmond, Mo.—This invention relates to a machine for working butter depriving it of butter-milk after taking it from the churn. The object of the invention is to obtain a simple and efficient device for the purpose and one which may be manipulated with the greatest facility.

CHERRY STONER.—Rufus Wright, Brooklyn, N. Y.—This invention relates to a machine for depriving cherries of their pits or stones, and it consists of a peculiar construction and arrangement of parts whereby the work may be done with great rapidity and in a perfect manner.

CARBURETTING MACHINE.—Iva Prichard, Terra Haute, Ind.—This invention is a simple and economical machine for the manufacture of illuminating gas from the volatile hydro-carbons.

PILE OINTMENT.—L. H. Mosely, Franklin, Tenn.—This invention is a compound which when properly applied works a speedy and infallible cure of the disease known as the piles.

RAILWAY SWITCH.—Joseph C. McCarty, Grafton, W. Va.—The object of this invention is to construct a switch by which the use of frogs can be avoided, and the cars be made to run always on a smooth, continuous track, and thereby to render the motion of the cars easier, and to save the wheels from wear.

CORN PLOW AND CULTIVATOR.—Isaiah B. Arthur, Sidonsburgh, Pa.—This cultivator is made with three handles, by which it can be more easily held and regulated. In connection with them, it has a new form of guards to protect the young corn from injury, and a new device for adjusting the instrument in width.

TOBACCO PIPE.—James Cook, West Groton, Mass.—This invention consists in placing and securing so as to be detachable at pleasure, within the bowl of the pipe, a cup or receptacle for the tobacco, that at its lower end is provided with a series of apertures for forming a communication between it and the stem, and with a space or chamber left around and between it and the interior of the bowl, whereby the stem cannot become clogged, and the smoke before passing to the mouth is cooled, as well as the tobacco kept dry and free from nicotine, as it is extracted by the smoking of the pipe.

GAS TORCH.—Wm. A. Lawton, New York city.—This invention relates to a method of constructing torches for the lighting of gas, whereby the alcohol or other fluid burned for that purpose is more economically expended.

VALVE.—Edward A. Rock, Ludlow, Vt.—This invention consists in arranging an open ring valve on the valve stem, which, when the valve is closed, shall be expanded by a stationary wedge in the valve seat.

TUNNEL EXCAVATOR.—Theodore A. Fisher and Anson F. Fisher.—This invention relates to a novel and useful method of constructing tunnels under water, and consists of an apparatus for boring and excavating the earth in the bottom of rivers, lakes, and other large bodies of water.

EYE GLASS.—J. K. McDonald, Newark, N. J.—This invention consists in the employment of soft rubber tubing for nose pieces, together with features of improvement.

BOOT ATTACHMENT.—Marvel M. Follett, Westboro, Mass.—This invention relates to a new and improved method of attaching the boot to the bodies of carriages, whereby they are rolled or wound up with more ease, and so as to occupy smaller space.

FILLING STEAM BOILERS.—E. Ferguson, Newbern, N. C.—This invention consists in attaching to the boiler a water supply pipe, which is provided with a suitable check valve, wherewith the boiler may be filled with water by the vacuum produced therein by the condensation of steam.

HARVESTER.—S. O. Bartow, Bethel, Conn.—This invention relates to a grain and grass harvester, and consists in an improved sickle-driving mechanism and an arrangement of the frame of the machine and gearing, whereby a very rapid motion of the sickle is obtained, and a clean, smooth cut of the same is obtained, with a moderate expenditure of power.

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BALE TIE.—Joseph Bragg Dunn, Petersburg, Va.—This invention has for its object to furnish an improved bale tie, simple in construction, which will hold the hoop securely, which may be easily applied, and which can be manufactured at small expense and without waste of material.

CORN PLANTER.—N. G. Hughes, Waynesburg, Pa.—This invention has for its object to furnish an improved corn planter, by means of which the ground may be marked and the seed dropped and covered at the same time and by the same operation.

SNAP HOOK.—John McKibben, Lima, Ohio.—This invention relates to an improved spring snap hook, the advantages of which are that while it secures all the advantages of other rein and spring snaps now in use, it is greatly reduced in size. By the position of the spring it acts as a guard snap, and as the spring is almost concealed within the hook, it is protected by the jaws that hold the lip on which it acts. It is also very compact, thus securing greater strength, so there is less purchase bearing upon it from its curtailed length of body and spring, also rendering it lighter, neater, and better, and more convenient.

VISE.—Samuel S. Barnaby, Macon, Ga.—The object of this invention is to produce a vise which will be of such a construction as to obviate the great inconvenience and loss of time now unavoidable with the use of all vises heretofore invented.

MACHINE FOR RAISING HEAVY WEIGHTS.—S. E. Tuttle, Genoa, Nevada.—This invention has for its object to furnish an improved machine by means of which heavy weights may be raised with a comparatively small outlay of power.

ROTARY STEAM ENGINE.—Chester B. Turner, Grand Rapids, Mich.—This invention consists in the arrangement of wings or valves on the piston core, or center, and in so forming the parts of the engine that the steam can be cut off at any part of the stroke, or at any desired point.

HORSE RAKE.—Oliver E. Randall, Lewiston, Maine.—This invention consists in the application of a separate and independent spring to each tooth bar, and in a peculiar lifting arrangement whereby the rake teeth, as hitherto, are allowed to conform to the inequalities of surface over which they may pass, and the rake at the same time allowed to gather up and retain a large quantity of hay or grain before being discharged.

PORTABLE SAWING MACHINE.—G. W. Bell, Rising Sun, Ind.—This invention has for its object to furnish a simple, cheap, and portable machine, by means of which timber for shingles, staves, fire-wood, etc., may be sawn in the woods without its being necessary to incur the expense and labor of transporting the logs to a machine, as is now the case.

STREET AND STATION INDICATOR FOR RAILROAD CARS.—Anthony Pirz, and Manuel Pirz, East New York, N. Y.—This invention relates to a new and improved street and station indicator for railroad cars, and of that class in which the names of the streets or stations are on a belt or band which is moved at certain proper intervals, after each street or station is passed, in order to exhibit to the passengers the name of the preceding street or station.

FLOUR SAFE AND SIFTER.—F. A. Hoyt, Hanover, Mis.—This invention relates to an article of household use, and consists of a sifter operated by a crank and gearing, the said sifter located over a drawer covering the flour receptacle beneath.

DITCHING MACHINE.—A. A. Taselier, Algiers, La.—This invention relates to an improved machine for excavating ditches or canals, and consists of a carriage mounted on wheels, to be worked and propelled on temporary movable rails, by a steam engine, and supporting drums for carrying an endless belt or chain to which are affixed excavating buckets.

CALCULATING AND REGISTERING MACHINE.—Thomas T. Strode, Mortonville, Pa.—This invention relates to an improved calculating and registering machine, being a simplification of the calculating machines heretofore invented.

COMBINED FLOUR SIFTER AND SCOOP.—G. W. & C. L. Sherman, Seymour, Conn.—This invention of an improved article of domestic utility relates to a flour sifter and scoop.

MACHINE FOR EMBOSSING WINDOW SHADES.—R. K. Slaughter, and J. O. Hundt, New York city.—This invention relates to a new machine for embossing window shades of all sizes with ornamental borders, corner or central pieces, and consists chiefly in the use of a sliding carriage, which is covered with a plate of rubber or other elastic surface, and which is provided with adjustable guide bars for guiding the rollers, by which the ornamental borders are produced, and for holding the shade to be embossed on the table.

HAY PRESS.—George W. D. Culp, East Enterprise, Ind.—This invention relates to an improved beater press, which is so arranged that the motion of follower can be reversed whenever desired, without reversing the motion of the horses; and that, furthermore, the beater or the follower, or both, can be thrown out of gear whenever desired, without stopping the horses, and in which an automatic self-opening and closing feed door is arranged in such a manner that when the beater ascends it will be closed, while it will open as soon as the beater is down.

SPINNING WHEEL.—S. W. Clark, Seneca, Wis.—The nature of this invention consists in a novel and useful modification of the ordinary domestic spinning wheel, enabling the operator to sit while spinning, and thus avoid the labor of walking to and from the head of the wheel.

WALKING VEHICLE.—R. C. Vernol, New York city.—This invention relates to a new manner of operating vehicles, and consists in the use of legs, to which a motion is imparted imitating as near as possible the motion of the human extremities. At least two legs or bars are arranged on each side of the platform of the wagon, or vehicle, and are secured to and suspended from a horizontal axle, which has its bearings on the platform. On the shaft are two circular eccentric cams, to which the legs are secured, the cams projecting equally far from opposite sides of the shaft. An alternate up and down motion is thus imparted to the two legs on each side of the platform.

BRICK MACHINE.—Ephraim R. Greene, and Henry D. Phillips, Trenton, N. J.—This invention relates to a machine for pressing and molding brick, and it consists in a novel manner of operating the plungers, by which the clay is forced into the molds, and in a novel manner of operating the molds, feeding them underneath the press boxes.

CORN GATHERER.—James Mains, Olena, Ill.—This invention has for its object to furnish an improved machine for gathering the corn, simple and inexpensive, in construction and effective in operation.

HORSE HAY FORK.—L. S. Mason, Middlefield Centre, N. Y.—This invention relates to a harpoon hay fork, which is provided with tines projecting from the sides of the shank, so that the hay, straw or grain will be prevented from slipping on the shank.

PORTABLE HAY AND GRAIN ROOF.—John J. Naylon, Brighton, Mich.—This invention has for its object to furnish a simple and convenient portable roof for covering hay and grain stacks, and for other purposes.

GRINDING MILLS.—John Snyder, Hart's Mills, Ind.—This invention has for its object to furnish an improved manner of hanging the upper mill-stone or runner, so as to insure freedom of motion and the proper and effective action of the runner and spindle, and at the same time to facilitate the tramming of the spindle.

WAGON HUB REAMER.—J. W. Emerson, Rochester, Minn.—This invention has for its object to furnish an improved machine by means of which wagon and other hubs may be reamed out quickly and accurately, so as to be ready to at once receive the cast-iron box.

DRYING AND VENTILATING APPARATUS.—Jarvis Royal, Rochelle, Ill.—This invention has for its object to furnish an improved means for drying and ventilating damp grain fish, and other things, stored in bins, holds of vessels and other places.

ANIMAL TRAPS.—Joel Manchester, New York City.—This invention has for its object to furnish a simple, cheap, and effective trap, by means of which animals may be killed and thrown from the trap, the trap setting itself for the next animal.

WOOD SAWING MACHINES.—Isaac B. Jones, Xenia, Ohio.—This invention relates to improvements in machines for sawing wood, whereby great strength, firmness, simplicity and efficiency of operation are secured.

BED BOTTOMS.—S. L. Southard, Rock Island, Ill.—This invention relates to an improvement in bed bottoms, and consists in an arrangement of compound special springs attached to the under side of the bed bottom and resting upon cross pieces set in the bedstead.

SEEDER.—Olney Fry, Jr., Albany, Oregon.—This invention has for its object to furnish a simple, cheap and effective machine for sowing grain broadcast, which shall sow the grain evenly and cover it at a uniform depth, thereby decreasing the labor and time required for putting in the grain, and at the same time increasing the yield.

PORTABLE PISTOL GALLERY.—F. A. Spofford & M. G. Rafflugton, Columbus, Ohio.—This invention relates to a device for supporting the aim and for retaining the balls, marbles, or other articles thrown at the aim, during target exercise with toy guns.

SECURING THE OUTER SOLE OR PATTERN AND THE HEEL TO BOOTS AND SHOES.—L. A. Favre, Paris, France.—This invention consists in securing to the underside of the inner sole, whether it is sewed or nailed to the vamp, a metallic plate, which is provided with small perforations or slots, and in securing said plate, either by nails, rivets, screws, or other suitable means thereon. The outer sole or pattern, which is to be connected to the sole and to complete the shoe, is provided with a set of projecting screws or tenons on its upper face, said screws or tenons being intended to fit into corresponding slots in the plate.

FASTENING BOILER TUBES.—James U. Adams, Richfield, Mich.—This invention relates to a mode of fastening tubes in steam boilers, and consists in attaching a thimble or ferrule having external and internal threads cut on it which screws engage with the internal threads upon the end of the boiler tube and with the external threads upon the boiler plate.

PORTABLE FENCE.—H. A. Stewart, Minneapolis, Minn.—This invention has for its object to furnish an improved portable fence, simple and cheap in construction, durable, easily taken down, set up, or transported from place to place, and which, when not in use, can be packed for storage in a very small space.

ELEVATING DEVICE FOR LOADING HAY, ETC.—Ezra N. Curtice, Spring Water, N. Y.—This invention relates to a new and useful device for making hay loaders, elevators, &c., and consists in applying rubber friction rollers to the front wheels, in such manner that they shall rotate one or more drums placed on the shafts of the friction rollers, and wind a rope for elevating hay, &c., as may be required.

BOILER FOR HEATING WATER.—John Ellis, White Plains, N. Y.—This invention relates to a boiler for heating water for buildings, green houses, and other similar purposes, and consists in arranging a series of horizontal pipes between two hollow heads, in such a manner that the water will flow at least twice through the tubes, so as to be very completely heated.

SAP SPOUT.—R. F. Livermore, Starksboro, Vt.—This invention consists of a metallic sap spout of such a form that many important advantages are secured over the common wooden spout as heretofore used.

CARPET HOLDER.—F. Smith, Alexandersville, Ohio.—This invention relates to a device for holding carpets upon the floors, whereby the same are more firmly held against the mop board and more easily at any time moved.

PUMP ROD.—H. F. Purmort, Saginaw City, Mich.—This invention relates to pump and drill poles or rods, and consists in a novel manner of jointing together the several sections composing the same, whereby rivets are dispensed with, consequently obviating not only all injury to the interior of the pump now resulting from the breaking and falling of rivets into the same, but also the frequent drawing up of the pump tube from the well to remove the rivets.

SAFETY HOOK.—E. F. Brundage, Virginia City, Nevada.—This invention relates to a safety hook for watch and locket chains, bridle reins, trace chains, etc. The object of the invention is to obtain a simple and efficient hook of the kind specified, and one which will admit of the jointed portion of the hook being readily opened and closed and also readily secured in a closed state.

STREET LAMP LIGHTER.—Albert Assman.—Rahway, N. J.—This invention relates to a device for lighting lanterns in streets, public buildings, railroad depots, or wherever a large number of lights are arranged too high to be reached without the use of a ladder or long lighter. The invention consists in attaching the lamp or light to the upper end of a pole of suitable length, and in arranging the pole and lamp within a tubular inclosure.

HOOKS FOR HOLD BACK STRAPS.—N. W. Robinson, Norwich, N. Y.—This invention relates to an improvement in hooks for hold back straps of harnesses, which improvement consists in a novel combination of a post with the hook, whereby the unfastening or detachment of the strap therefrom, by accident or otherwise, except so desired, is rendered impossible, while at the same time the unhitching of the strap, if desired, can be accomplished with the utmost ease and dispatch.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

W. M., of Canada, asks how he can lengthen boiler tubes three-eighths of an inch. They are 7 feet, 8½ inches long by 3½ inches diameter and were cut too short by three-eighths of an inch. We think they might easily be lengthened by heating, two feet or so between the ends and then stretching them in an ordinary horizontal screw press. Or, they may be slightly drawn by means of a die which may be made in halves, one half to be forced upon the other by a screw.

G. & P., of Ky., ask how to bronze or lacquer the handles of steel instruments. We have often answered similar questions and should, in justice to ourselves, refer this correspondent to back numbers of our paper; but, as we have frequent inquiries on this subject we will repeat what we have several times said before. An ordinary coating of a coppery color can be deposited on polished iron or steel by immersing the article in a solution of sulphate of copper (blue vitriol), the mineral being dissolved in water. But if a more brilliant bronze is required it can be produced by simply painting the article with a sizing and sprinkling it with bronze powder. Coating iron or steel with bronze can be done only by a deposition of the copper or brass on the surface of the iron by the galvanic battery. It is difficult and costly.

In reply to a correspondent who asked how to harden plaster of Paris casts, X says: A little glue dissolved in the water with which plaster is mixed will harden it to almost any degree. Experiment will soon determine the proper quantity for the degree required.

N. C. L., of N. Y., asks if it is not time for "C," of Troy, N. Y., to explain, as promised, his system of cypher published in No. 18, Vol. XVII. He says: "I, for one, have worried enough over it."

J. L. B., of Iowa, says he has a well 45 feet deep, surface of water generally within 20 feet of the ground, never more than 25 feet. From well to house 100 feet with rise of 12 feet. He wishes to use wind power for pumping so as to supply a reservoir at the house at all times, but there are tall trees near the well which would interfere. He asks if he can locate the windmill near the house and what sort of pump he shall use. There are plenty of good pumps in the market intended for lifting and forcing. The proper location for a pump in this case would be at the well so that it could lift 25 feet and force 12 feet higher through 100 feet of pipe. Of course, the windmill and pump should be located together. If the pump and power should be located at the house it would we think be found difficult, even with an air chamber, to obtain a supply from an ordinary lifting or suction pump. Any sensible pump maker or dealer can overcome your difficulty on a personal inspection of the premises.

G. W. E., of Wis., asks us to give him the rule for calculating horse-power of non-condensing engine. John Bourne states it briefly thus: "Multiply the square of the cylinder's diameter in inches by the cube root of the length of stroke in feet, and divide the product by 47. This is the nominal horse-power." We prefer to state it thus: "Multiply number of feet traveled by the piston per minute by the pressure of steam on the piston and divide by 33,000." We choose that you apply the above to the data you send rather than have us tell you the power of your ten-inch cylinder engine.

J. F. L., of Ohio.—Henry Carey Baird, 406 Walnut street, Philadelphia, Pa., will probably furnish you with a manual on sugar refining from which you will obtain more information than it is possible to crowd into our columns.

G. H. W., of N. Y.—"How many feet of grate surface will be required for a boiler nine feet, six inches long with thirty two-inch tubes?" The rule is to allow one square foot of grate surface to twenty inches flue surface. See No. 9, Vol. XVII SCIENTIFIC AMERICAN for the proper method of setting boiler. It has saved our readers already many hundreds of dollars.

F. M. D., of Va., asks "what is the best mixture to temper [harden] files in?" Files are not generally "tempered" they are left of full hardness. There is no "mixture" equal to clean cold water for file hardening. Before they are heated for hardening the teeth are coated with strong brine thickened with beer grounds, yeast, or bean flour and allowed to dry. This makes a protecting flux for preventing the teeth from burning.

G. G. B., of Conn., inquires "whether yellow pine or cypress is to be preferred for frame and tressle work for water wheel where the timber will be exposed to water and steam." The cypress in use in this country is not the true cypress of which we read in sacred and profane history. It is a deciduous tree whose value for timber exposed to constant moisture we do not fully understand. The yellow pine is very long lived under the circumstances mentioned.

G. W. R., of Pa.—"Can you tell me the ingredients of a good marking ink that will not evaporate and will resist the action of rain, etc.? I want something better than the mixture of lamp black and turpentine now used." We have used successfully shellac varnish thin, with lamp black stirred in. It will evaporate but will stand water. The evaporation, however, is necessary if you want the marking ink to dry rapidly.

E. B. R., of Mass.—"Can you inform me of the best method of conveying power a distance of one hundred feet, whether by a leather or other flat belt or a rope running over a wheel with a V-groove?" The latter method we put in practice nearly twenty years ago, the distance between points being over two hundred feet. It was speedily rejected for the ordinary belt and pulleys. We know of nothing better than flat belts or a continuous shaft. The rope is unreliable and annoying.

J. S., of Pa.—The essential oils of wintergreen, mint, spruce, hemlock, etc., are procured by steam distillation of the leaves, buds, blossoms, or roots of the plants. For processes and full details we refer you to the "Art of Perfumery" by Piesse, published by Lindsay & Blakiston, Philadelphia, Pa., or to "Perfumery: Its Manufacture and Uses," by Campbell Morfit, published by H. C. Baird, 406 Walnut street, Philadelphia, Pa.

Business and Personal.

The charge for insertion under this head is one dollar a line.

Inventors and Patentees wishing to get small, light articles manufactured for them in German Silver or Brass, address Schofield Brothers, Plainville, Mass.

$300 will buy a Patent of A. Grushus, St. Paul, Minn.

Agents wanted everywhere—enormous profits. Sample doz. $1 50. Retail for $3 each. Thomas Powell, Milroy, Ind.

Scale removed from Boilers by Winans' Powder (11 Wall st., N. Y.), 12 years' use proves it reliable an uninjurious.

For Steam and Gas Fitters Tools, Machines for Hand or Power to Screw and Cut-off Gas pipe; stocks, dies, pipe, vises, Peace's adjustable pipe tongs, address Camden Tool and Tube Works Co., Camden, N. J.

Address J. S. Elliott, East Boston, Mass., for best machinery for making lime and sand building blocks.

Good 2d-hand engines, all sizes & styles. A. Logan, Tideoute, Pa.

Persons having the best barrel and bucket machinery send circulars to D. C. Baggerly, Luray, Page Co., Va.

Manufacturers of potato diggers send circulars to H. C. Oathout, Luana, Iowa.

Inventions made for those desiring them, or aid lent to perfect others. Address A. E. Watkins, 114 Fulton st.

Hamilton's self-oiler for shafting uses one half-pint of poor oil for two-inch bearing in three months. Has been in constant use two years, and fast coming into use. Rights for sale by A. G. Stevens, Manchester, N. H.

J. N. Proctor, of Albion, Orleans county, N. Y., wants the address of Inventors and Manufacturers of Brick Machines with descriptive circular and mode and operations for burning Brick.

W. C. Stripe, Keokuk, Iowa, wishes to obtain a mill capable of grinding fifteen barrels of lime per day,

Manufacturers of Wood-working Machinery send Catalogue and prices to Wm. Z. Hallam, Denver, Colorado Ter.

EXTENSION NOTICES.

Mahlon Loomis, of Washington, D. C., having petitioned for the extension of a patent granted to him the 2d day of May, 1854, for an improvement in plates for artificial teeth, for seven years from the expiration of said patent, which takes place on the 2d day of May, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 13th day of April next.

Philander Shaw, of Boston, Mass., having petitioned for the extension of a patent granted to him the 2d day of May, 1854, and reissued the 17th day of July, 1860, for an improvement in air engines, for seven years from the expiration of said patent, which takes place on the 2d day of May, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 13th day of April next.

Conrad Liebrich, of Philadelphia, Pa., having petitioned for the extension of a patent granted to him the 2d day of May, 1854, for an improvement in trunk lock hasps, for seven years from the expiration of said patent, which takes place on the 2d day of May, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 13th day of April next.

E. G. Allen, of Boston, Mass., having petitioned for the extension of a patent granted to him the 27th day of October, 1857, for an improvement in steam pressure gages, for seven years from the expiraton of said patent, which takes place on the 27th day of October, 1871, it is ordered that the said petition be heard at the Patent Office on Monday, the 29th day of June next.

E. G. Allen, of Boston, Mass., having petitioned for the extension of a patent granted to him the 22d day of November, 1859, for an improvement in combination steam gage, for seven years from the expiration of said patent, which takes place on the 22d day of November, 1873, it is ordered that the said petition be heard at the Patent Office on Monday, the 29th day of June next.

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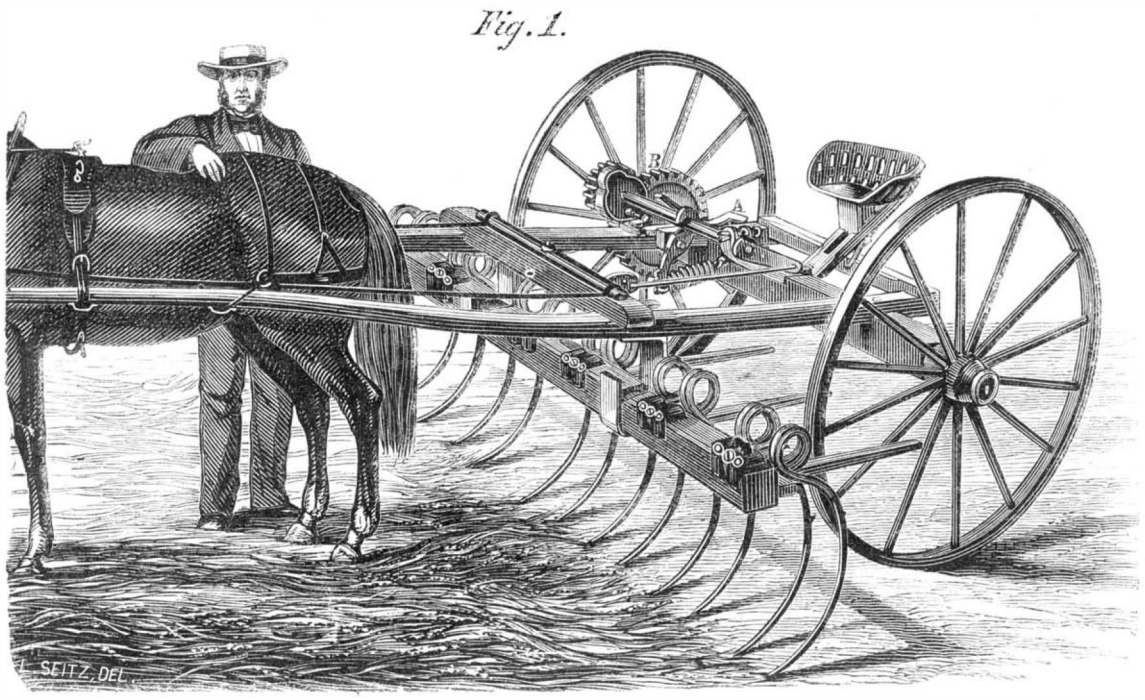
Improvement in Horse Hay Rakes.

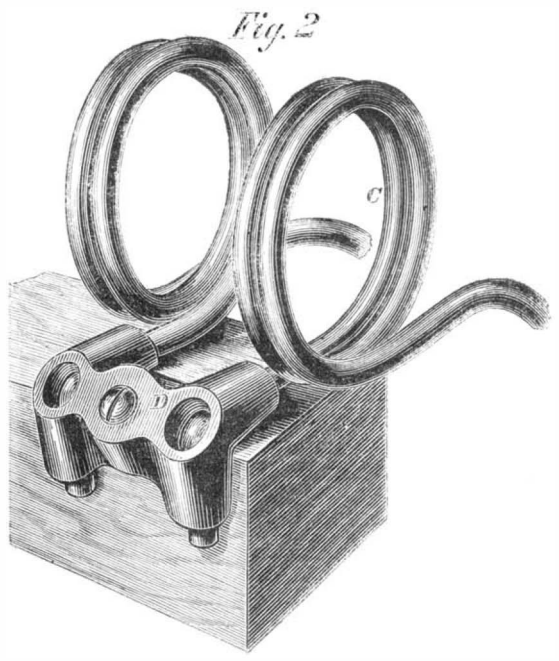
After an examination of the machine represented in the engravings accompanying this description, practical farmers will notice its simplicity of construction, its ease of operation, lightness, compactness, and efficiency. The driver has both hands at liberty, to be used in guiding the horse; the work to be done and the work already done is straight before him, and a touch of his foot on a pedal lever will discharge the windrow of hay and return the rake teeth to position instantly.

The general appearance and construction of the machine will be understood by reference to Fig. 1, and the peculiar method of securing the teeth to the rake head by Fig. 2. The driver's seat is placed at the extreme rear of the implement, it being capable of being raised or lowered on the spring-board which sustains it, to accommodate any length of leg, by means of a bolt, traversing a slot in the support, and a lever nut. In front of the driver is a bell crank with a projection, A, for his foot, the crank, or lever, having a hook engaging with the delivery shaft to throw the pinion on that shaft in gear with the cog wheel, B, secured to the hub of one of the driving wheels. When the bell crank is not pressed down by the foot a spiral spring underneath the shaft and attached to the lever, keeps the pinion from meshing with the main gear wheel. The end of the counter shaft, carrying the pinion, opposite from the driving wheel, has a crank which connects by a rod with an arm on the rake head by which the head may be partially rotated and the teeth elevated or depressed. While the rake is gathering the hay the pinion is disengaged from the gear wheel; soon, however, as the teeth are filled the driver touches the pedal, engaging the pinion with the larger gear, and the crank on the pinion shaft actuates the rake head and the teeth. The rake is held in position, whether elevated from the ground for driving over common roads, or depressed to perform its work, by means of a hollow cam on the inside of the pinion and revolving with it. This cam has two depressions, one opposite the other, in which a fixed horizontal catch or bar engages to hold the pinion shaft firmly in the position desired. The driver has only to press his foot on the pedal to disengage the catch when the pinion shaft will make only half a revolution, being stopped by the action of the catch engaging with the depressions on the cam. This action of the rake head, cam, etc.; can be secured by the driver whether the machine is running forward or backward. The devices for securing the delivery action of the rake head are very simple, the mechanical arrangements being few in number and not liable to derangement. A bar secured to the rear of the rake head has a number of horizontally projecting fingers between the rake teeth to prevent the hay from being crowded up beyond a certain point.

Fig. 2 shows a simple device for securing the rake teeth to the head. The teeth are of round steel, coiled as at C, to form a spring, the ends being bent and held in recesses in the casting, D, which contains two teeth the whole being secured by a single screw or bolt. The rake head is sustained in boxes which allow of its adaptation to unevenness of the surface of the ground. It is evident that the horse, and not the driver, does the work, the draft of the machine holding the teeth to their work. The rake will always conform to the surface of the ground independent of the wheels. The draft of the horse is directly in front of the work so there is no lateral or side pull. The grass is gathered before the wheels can press it into the ground as the rake is in front of the wheels. The ease of operation of this machine is illustrated by the following statement from the inventor; "A son of Mr. James Taylor of Sutton, Mass., only seven years old raked one hundred tuns of hay in one season—1863—with this machine, and has repeated the work for the four years succeeding." Several patents have been issued on this rake, and an application on other improvements is pending before the Patent Office.

All communications relative to this implement should be addressed to J. C. Stoddard, Worcester, Mass.





STODDARD'S SELF-OPERATING HORSE HAY RAKE.

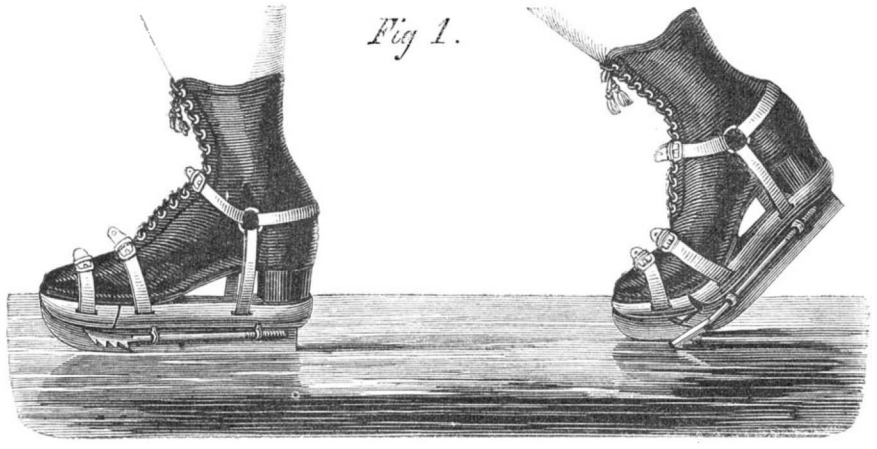
Defenses Against Hurricanes.

In the London *Mechanics' Magazine* of January 10th we notice a correspondent's plan for the protection of buildings, plantations, etc., from the effects of hurricanes, intended for the West India islands, where during the past few months great devastations have been done by the forces of nature. The idea is to build the houses, whether dwellings or otherwise, like that of the "old woman who lived under a hill," partially subterranean, and then to erect pyramidal structures of iron "in combination with wooden beams, wire ropes, chains, etc.," to break the force of the gale, etc., etc.

Now, we would suggest to this correspondent to give the public, and especially the miserable inhabitants of the torrid zone, some idea of protection against earthquakes. Cannot he show how buildings may be erected on rollers or balls so that their foundations may be moved without displacing the walls?

Improvement in the Construction of Skates.

Since the skating mania has spread over the country, all classes, young and old, have endeavored to avail themselves of this health-giving amusement. Among the chief difficulties that grown persons have to encounter are weak ankles and cold feet; in fact, skating, in place of being an amusement, soon becomes a labor to them.



BROWNLEE'S PATENT ICE AND PARLOR FLEXIBLE SKATES.

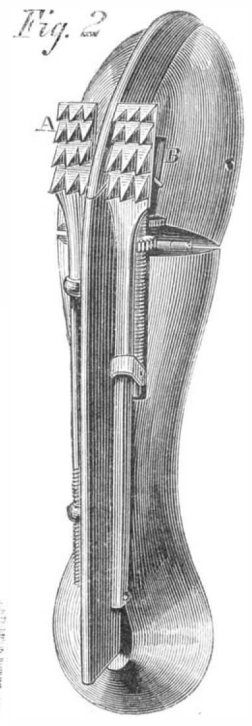
Th . jointed or flexible skate is intended to remove these difficulties. With this article any person that can walk can skate; he has no new motions to make with his feet or legs; all h e has to do is to start off as if walking, and his feet are not bound up like club feet, and he uses the same muscles and motions as walking, his feet not becoming cold nor his muscles soon tired. Ladies can put on these skates at home, screw up the claws, (unless there is ice in the road), and walk to the skating pond or rink. These skates being propelled by claws, which take hold of the ice as the foot is bent, there is no necessity for fluted or sharp edges to cut up the ice or retard the skater and turn his amusement into work. By having the claws shod with rubber, this improvement can be applied to roller or parlor skates. Any good mechanic can see how to apply this improvement to old skates without much expense. A patent for this improvement has been issued to Geo. Brownlee through the Scientific American Patent Agency, Dec. 24, 1867. Any information desired in regard to the sale of rights will be given by addressing G. & C. Brownlee, proprietors, at Princeton, Ind.

The description may be very brief as the engravings sufficiently exhibit the peculiarities of the device. Fig. 1 represents the skate in use on the ice, one foot receiving the weight of the body, and the other being in the act of beginning a forward movement. Fig. 2 presents a bottom view of the skate, showing the runner—the edge of which is round like that of a sled or cutter—and of the attachments on its side intended to grasp and adhere to the ice for the purpose of propulsion. A shows a single lever claw, intended for low irons, adjusted merely by a screw on its rear end, and held in place by guides. B is a double lever claw, the back end of the long lever pivoted and the claw end controlled in its action by a short screw lever, having a nut on it seated in a recess between the two hinged parts of the skate, and acting as a fulcrum for the short lever, which by means of a sliding yoke or clasp, and the nut, can govern the hight of the claw and its motion.

Curculio Arrester.

General William H. Noble, of Bridgeport, Conn., has lately patented an apparatus for preventing the curculio from ascending fruit trees. He says:

"This invention is designed to prevent the ascent of or to drive the curculio from fruit trees, vines, etc. It needs not that I should say anything to show the importance of preventing the attacks of this insect upon fruit trees; this is too well known to all experienced in horticulture, and many devices have been practiced to destroy the insect, or prevent its devastations. It has been found, by practice, that a slight jar upon the tree or vine causes the curculio to let go its hold and fall to the ground. It is well known to horticulturists that the curculio is very timid, and to this weakness I attribute the effect of the slight jar upon the tree, as the jar requires to be only so heavy as will simply give the slightest shock, and scarcely perceptible to the person, to cause the insect to fall to the ground.



"My invention consists in the arrangement of an automatic hammer, in such relative position to the tree or vine which it is designed to protect, that the hammer may so strike the tree or vine, or rods, or frame, attached thereto, as to give the slight shock required.

"A hammer is arranged in connection with a clock work, so that the hammer is caused to vibrate as often as may be expedient, and should give from ten to fifteen blows per minute, and this is arranged in such relative position to a frame that the hammer may strike on the frame. A clock work set in motion, by winding or otherwise, causes the hammer to strike the frame, and, through the blows constantly given, a jarring effect on the tree is constantly kept up, and when so continued, the curculio will not ascend, or, if ascending, will drop to the ground, where it may be destroyed in any convenient manner.

"For vines, a single apparatus may be sufficient for a long frame, but for trees. one apparatus should be attached directly to the tree, and I prefer that it be so attached at some little distance above the roots; or several trees may be attached to rods, so that a single apparatus may answer the purpose for many trees."

GOLD filings are saved only because the metal is deemed precious; but iron filings are of real value, mechanical and medicinal, but are frequently foolishly thrown away.—*Verb. sap., etc.*

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Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ Messrs. Trubner & Co., 60 Paternoster Row London, are also Agents for the SCIENTIFIC AMERICAN.

☞ "The American News Company," Agents, 121 Nassau street, New York

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VOL. XVIII., No. 8....[NEW SERIES.]....*Twenty-third Year.*

NEW YORK, SATURDAY, FEBRUARY 22, 1868.

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(Illustrated articles are marked with an asterisk.)

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CONCERNING STREET CARS.

Certain London capitalists, whom we might almost designate philanthropists, having at heart a desire for benefiting the masses, and at the same time being wise enough to foresee in the project a paying investment, are endeavoring to introduce our popular democratic and American institution, horse cars, into the English metropolis. For two successive sessions have these individuals petitioned Parliament for powers to carry their project into effect, but without having their prayer answered. Yet with a commendable pertinacity again have they published, according to law, the prescribed notices of their intention to once more apply for a bill, in the session of 1868. There is a certain proverb which assures success for the third trial, and if there is any trace of truth in this popular notion, the petitioners will this time come off triumphant.

If tested by the greatest amount of service rendered to the largest number of the community, the street cars in this country may be regarded as one of the greatest among public benefits, their general use upon the principal thoroughfares of all our large cities affording proof sufficient that they fill a wide-spread public demand. But these railways, it must be admitted, are not without their disadvantages, the presence of the "permanent way," as the English style it, proving a constant and considerable impediment to general traffic. It is needless to expatiate on the difficulty which ordinary vehicles experience in crossing and recrossing the tracks, our only purpose now being to give some suggestions relative to obviating this really serious annoyance. If rails could be entirely dispensed with except when actually in use, a great desideratum would be attained, but up to this time cars which are constructed to lay and take up their own tracks, of which there are many styles, all theoretically perfect and working well as models simply, have signally failed in actual practice. If then we must tolerate the iron rails in our streets, what form is least objectionable?

The London company before referred to propose to lay down a crescent rail which will be on a level with the street both on its outer side and between the rails, the only break in the surface being a groove on the inner side of the rail for the flange on the car wheels, such groove being too narrow to take in the tire of any ordinary street vehicle. By employing this rail, the company contend that the level of the street will not be broken nor the passage in any direction by ordinary carts and carriages obstructed, the whole width of the road being preserved for continued public use. Such a rail could never be used in this country for the groove would be continually choked up, in summer with dust and street waste, in winter by the more formidable snow and ice, and it seems hardly possible that the track would prove a success in England.

In our last issue we gave, on the authority of a newspaper correspondent, a short notice of the style of track adopted in the streets of Paris. The rails are simple metal plates spiked down, while the wheels running on them are without flanges. The cars are made to keep on the plates by means of a fifth wheel, which has a flange but half an inch thick, a mere disk, running in a grooved central rail, laid for the purpose. This extra wheel, being attached to the car by a lever, is to be raised at will and the car run off the track, a feature of the plan, we may remark, whose desirability is not so apparent, a short turnout being a preferable method of allowing cars to be run in both directions with but one track. The Paris plan, however, certainly embodies several and important adventages. Ordinary vehicles can in no way be inconvenienced, but on the other hand the permanent way may be of positive service. The same objection, however, can be urged against the central as well as all other grooved rails.

Now a simple modification of this Parisian idea, it seems to us, would furnish a track, if not perfect, yet a decided improvement upon any plan that has ever fallen under our notice. Let two extra wheels be provided. one at the front, the other at the rear of the car, both running on a central rail. The latter is merely a continuous iron bar slightly raised above the street level, the wheels themselves being grooved or made with double flanges. The advantages of such a method are too apparent to need particular mention, and if our street railways were laid out accordingly, the objections now existing, and which prevent the laying of tracks in some thoroughfares, we are confident would no longer exist.

GATHERING, DISTRIBUTION, AND UTILIZATION OF SEWERAGE.

The usual method employed in our cities of discharging the accumulations gathered at our water closets directly into street sewers, is not only wasteful but more or less injurious to health, the exhalations from fermentation and decomposition finding their way back to our dwellings and tainting the atmosphere we breathe, notwithstanding the precautions taken by means of gas traps and other similar contrivances.

The same objection will apply to the attempt to carry off the excretæ by a flow of water; the solid and liquid portions will be removed, while the gaseous components pass back, by their ascencive force, to the rooms.

Another system has been devised by Capt. Chas. T. Liernur, of London, from whom we have received a description with diagrams, which latter, however, we do not think are necessary to arrive at a correct notion of the nature of the invention. It is in use at the Hague, the capital of Holland, and has proved highly efficient. The plan is to connect the pipes leading from the rooms to air-tight reservoirs of boiler iron situated under the street crossings and of capacity sufficient to receive all the excrements which may accumulate during one, two or more days, as desired. These pipes are at least five inches in diameter and are provided with valves which may be operated from the sidewalk. The pipes are, of course, air-tight. Tho privies have each a pipe leading to the delivery pipe, and in case of one water closet being above the other, drooping lips inside the pipe compel the filth to follow the middle of the pipe, so that there may be no adhesion of the matter to its sides. From this delivery pipe one is carried up above the roof of the building acting as a chimney to carry off the effluvia to the upper atmosphere. The receiving pipe has a short upward curve just before it reaches the street reservoir, which receives the excrementitious matter until it is ready to be taken away.

Every night, or as often as may be necessary, a movable air pump driven by steam is brought to one of the reservoirs, a flexible hose is placed over the reservoir and connected by a coupling, when the air is pumped from the tank, the sidewalk valves being shut, and the contents of the pipe and tank are emptied by atmospheric pressure, or suction, into a movable tank accompanying the steam engine and pump. As soon as the vacuum has reached the proper point, indicated by a gage, the valve communication between pipe and tank being opened, the filth rushes into the tank, the air pump being kept in operation during the process, and thus aiding in effectually cleaning the pipes even to their upward openings, and compelling even the gases to accompany or follow the solid constituents. After being collected, the contents of the tanks are carried to some point outside the town where they are barreled and sent to the country. Capt. Lienur's plan comprehends, also, the method of application of the manure to lands. a subject which we reserve for another notice.

PROCESS OF SUGAR MAKING IN MAURITIUS.

There is no department of manufacturing industry in which more progress has been made during the last ten years than in the production of sugar. It is equally true that there is none in which so much remains to be done. The extraction of white sugar direct from the juice of the cane and beet, without refining, is now an accomplished fact. At the great Exposition in Paris, beautiful specimens from three estates in Mauritius were exhibited and took gold medals. Our Paris correspondent took pains to obtain specimens, which may be seen by application at our office, and every person interested in the subject of sugar will do well to call and examine these beautiful samples, produced without the use of a particle of bone black, and without the addition of any injurious chemical substance.

M. Poulin, one of the three enterprizing planters who received the gold medal as before stated, gives the following simple statement of the process employed:—

"The canes are crushed in very powerful steam mills, the cylinders of which turn extremely slowly, so as to squeeze out all the juice. The juice is received in troughs and a certain quantity of sulphite of soda (neutral and anhydrous, *i. e.* without water) is added to it. After this first operation, the object of which is to prevent the juice from fermenting in the defecating troughs, it is saturated with lime (the quantity varying according to the quality of the juice), and it is then drawn off into an apparatus called an '*appareil à triple effet,*' which is a set of vacuum pans three in number. It is then boiled at a very low temperature in these vacuum pans. When the sirup is concentrated to the granulating point, it is left to cool. When cold it is put into a turbine or centrifugal, which is made to perform 700 revolutions per minute. The sugar is 'clairced,' or clarified, by having thrown upon it a 'claire,' *i. e.* a sirup, which is ladled out of a jar or tub and thrown upon the revolving mass of sugar by a workman.

"The claire is simply a sirup of sugar, or molasses, into which has been previously introduced a certain quantity of water, so as to reduce the sirup to a density of 35 degrees (Baumè's aerometer, called also a *pèse syrop*). As the workman pours in the claire the sugar becomes white, and when the cleansing process is thus accomplished a jet of dry steam is let into the turbine. This jet is sent directly into the center of the turbine.

"A jar or tub for the claircing or clarifying sirup is attached to each turbine and bears a fixed proportion to its capacity. The workman pours this sirup upon the revolving sugar with a large iron ladle, about three-fourths pint; so that the contents of the turbine are clarified by a single jet of the sirup, and in from three to four minutes. The sirup usually employed in turbining the sugar is obtained from that part of it which flows from the turbine.

"In Mauritius the sirups from the turbine are usually reboiled a second and third time, so as to extract from them every particle of crystallizable sugar. The residuum of the third boiling is generally sent to the distillery and used for making rum.

"By means of this process canes cut in the morning may furnish sugar perfectly ready for packing and shipping by evening of the same day. But for the full practical understanding of all the niceties of the process, a visit to the Mauritius might be useful, for much depends on practice. For instance, the success of the claircing in the turbine depends in a great degree on the skill of the workman in charge of the ladle; and this skill is the result of practice and observation. So also in regard to the jet of steam sent into the turbine, and *which must be dry, i. e.*, heated to a degree where it ceases to be moist, as moist steam would cause the sugar to melt in the turbine, instead of drying, as happened in the beginning in Mauritius, where the planters began by using condensed steam, which is very bad.

"The very large and splendid crystals shown in some of the samples are easily obtained; but they cost more and are inconveniently slow in melting. Those samples in the Exposition were made simply to show what can be done; but they would be unsuitable for general use, as they would take a good half hour to melt in water.

"Let any one desirous of ascertaining the relative qualities of European-made and Mauritian-made sugars, dissolve the latter in a glass of water and observe its delightful perfume. But in order to have this fine odor, the sugar must not have undergone fermentation, nor have been subjected to refining by bone black. All the Mauritian sugars made by this process have this perfume, and all are, strictly speaking, raw sugars, *i. e.*, they are purified by a mode of fabrication from the juice, which is not refining, and which makes no change in their natural savor.

"The Mauritian sugars are only admitted into France under the specification of "assimilated sugars," in order that they may be made to pay the same duties as "refined sugars." The scale of duties levied here and in England on Mauritian sugars practically excludes them from both markets. This exclusion is kept up simply in the interest of the refiners of both countries. The Mauritian sugars are mainly consumed by India and Australia, which admit them free.

"The flavor of anything made with these Mauritian sugars is said to be superior to that of things made with refined sugar. Preserves made with it are said to keep much longer, and it is considered much more wholesome."

We hope that our Louisiana sugar planters, and the enterprizing men who are preparing to introduce the manufacture of beet sugar into our country, will give these remarkable results of modern science an enlightened consideration.

IRON PUDDLING BY MACHINERY.

A correspondent writing from St. Johns, New Brunswick, on the above subject, says that as a general thing puddlers discourage all attempts to introduce machinery as an aid to the arduous and exhaustive labor to which they are now subjected. But, nevertheless, a number of attempts have been made to that end. "As far back as 1836, a patent was granted to Dr. Charles Schafhæutl of Dudley, England, for an 'improved apparatus to impart a compound motion longitudinally and transversely to the puddling tool.'" This invention was found to be imperfect, but no doubt has started numerous later inventions for the same purpose, among which I may mention Bennett's, Griffith's, Harrison's, and others, all secured in England during the last six years. Bennett's machine is placed on the top of the furnace, a lever through which the motion is imparted to the tool hangs down in front of the fire door. The power is taken from the engine by a long connecting rod, which moves backward and forward, sliding at the same time the lever which holds the tool around a quadrant to impart the side motion. It is rather a difficult matter to describe the machine without drawings, but probably the explanation I have given may enable some to catch at the idea I have endeavored to convey. Mr. Griffith's machine is, I believe, on the same principle. Mr. Harrison has placed a small cylinder, either for steam or water pressure, over the furnace, to furnish the movements for his machine. When started, it works the rubble backward and forward, and around the bottom of the furnace, but whether it is an improvement on the other two patents I have no means of knowing. Bennett's machine is now in operation at his works, and answers a good purpose,—so I heard from a workman last spring. I saw in the Iron Master's Association book of the United States, that Mr. Grove, of Montour Rolling Mills in the State of Pennsylvania, had introduced machine puddling in his works. Perhaps he would be willing to give some information on the subject.

In 1863, a patent was granted to Messrs. Walker & Warren of Wolverhampton, for a rotary puddling furnace. This patent was purchased and experimented upon by the Dowlais

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Iron Company, under Mr. Menelaus (who wrote a paper on machine puddling, to be read before the Institution of Mechanical Engineers, of Birmingham). As this company erected several of these furnaces, with a capacity of sixty tuns a week each, it must have been considered a success, although I have never heard of its being adopted elsewhere. This patent furnace requires no assistance to puddle the iron. The iron is run in melted, the machine set in motion, and the charge boiled or balled, ready for the hammer or squeezers, without further assistance. The body of the furnace is a cylinder lined with probably something the same as the Bessemer retorts, and made to hold about five cwt. of iron. It is hung on large journals at each end of the cylinder. Through these journals the flame passes from the stationary grate to the stack. The operation of the machine keeps the fluid iron constantly in motion, and prevents it from adhering to the inside of the cylinder; and as it comes to "nature," it gets gradually rolled into a ball the shape of the inside of the furnace. The iron made by this furnace was said to be of a more uniform quality than could be made by hand or by the assistance of other machines. A bloom and specimens of finished iron made of it were exhibited at the same time Mr. Menelaus read his paper on machine puddling in Birmingham.

The Rusting of Iron.

Perfectly pure water will not rust iron until it is heated to redness, when the contact with the metal instantly forms a red-heat crust. If iron again be left for a very long time in water, a yellow envelope of hydrated peroxide will be formed. Water charged with atmospheric air will not rust iron, but oxidation will take place as soon as the air has constant access. According to Martell's and Hall's experiments, the rusty envelope is to be attributed to the presence of carbonic acid in the air, where, in its normal condition, it exists on an average of 4 in 10,000 volumes. Water charged with carbonic acid oxidizes iron with rapidity under visible evolution of hydrogen, the process being expressed by the following formula:

$$3HO+Fe+CO_2=Fe_2O_3\,CO_2+3H.$$

The temperature at which steam is decomposed by iron is at a red heat, but at the white heat the oxide loses partly its oxgen and forms the double combination of peroxide and protoxide, having the formula of magnetic iron.

The French chemist Gay Lussac holds that iron cannot be oxidized higher than 37·8 parts of oxygen to 100 parts of iron, answering very nearly to the above-mentioned double combination.

Water oxydizes iron more rapidly when it receives small quantities of mineral acids, while on the other hand an alkali or caustic lime destroys the oxidizing faculty of water, a fact which is easily explained when we consider what strong affinity carbonic acid has for those bases. We are indebted to Fayen for the determination of the limits of this veto power which alkalies possess over the oxidation of iron in water. He ascertained that a saturated solution of potassa lye diluted with from 1,000 to 2,000 parts of water could still protect iron, but not when diluted with from 3,000 to 4,000 parts. Saturated lime water, when diluted three times, protected iron, but not when diluted four times. Saturated carbonate of soda, diluted with from fifty to fifty-four volumes, protected iron, but not so when diluted with even fifty-nine volumes. The finest cast steel was protected perfectly by even less potash.

Iron is perfectly oxidized by being often sprinkled with pure water, and then on being exposed to red heat loses 1·74 per cent of water, having in fact been a hydrated peroxide with a formula, Fe_2O_3, HO. Moist air rusts the iron yellow, and Bergmann considers the rust to be a compound of 76 Fe_2O_3 and 24 CO_2; Hausmann, of peroxide and water—but it is, as Thompson and Karsten have shown, a true hydrated basic carbonate of peroxide.

Rust is porus, and like all porous bodies, absorbs gases. White pig metal scarcely oxidizes; gray iron with more facility, bar iron still easier, especially when red hot. Cold, short iron rusts least and slowest. Polish is the best preventive of rust, particularly when the article is kept in dry air. There are many recipes given of compositions designed to prevent oxidizing, but a coat consisting of common resin melted with a little gallipot oil and spirits of turpentine is generally considered to be the best. Bleaching also, in a slow fire, is a protective against rust, and this is constantly used for nails and tacks.

Improved Artificial Leather Belting.

Patented by Stephen M. Allen, Woburn, Mass.

I take ordinary scrap leather, though preferring the skivings or shavings of the cuticle, from tanneries, shoemakers' or curriers' shops, and soak and wash the same before or during the process of pulping, sometimes with pure cold or warm water, and sometimes using alkalies, or any other property which will separate the tannin from the scraps of leather, so that when pulped and dried the fiber will adhere strongly together, and be less likely to absorb moisture. I then prepare the untanned scraps of hides, sometimes in lime solutions, or solutions of salts, so as to remove the stiffness when dry, without destroying either the fiber itself or the adhesive properties of the glue or gelatine in the same. When the fiber is thus prepared, the tanned and untanned fiber will readily unite in combination, and will also unite with vegetable fiber, either with or without other gelatinous or resinous substances while pulping. I sometimes add to the combination of fibrous substances, when the same is being pulped, a proper quantity of bullock's or animal blood, which, with the previous preparation of the animal fiber, as before described, will make nearly a water proof sheet of artificial leather, and the same will not be susceptible of absorbing moisture, so as to cause a belt to contract or expand, either under the influence of heat or a humid atmosphere. When properly pulped, the same may be run off on an ordinary paper machine, or between rollers, and doubled to a proper thickness, and may be used either with or without further preparation, by printing, japanning, stitching, or water-proof applications. I usually subject the belting to a high temperature of heat, to set the gluten and other resinous properties, and sometimes vulcanize the same, though for ordinary use it is not necessary.

Bromo-Iodized Rubber.

The following process of treating rubber and other gums without the use of sulphur has lately been patented by J. B. Newbrough and E. Fagan, New York city: By adding to iodine one half its weight of bromine proto-bromine of iodine is formed, and this, when combined with rubber, or equivalent gum, will produce a composition which will harden on being subjected for about an hour to a heat of 250° Fah. Owing to the volatile properties of proto-bromide of iodine, it cannot be applied without difficulty to practical purposes. To obviate this difficulty, we treat both the bromine and iodine, prior to combining the same, with oil of turpentine, or similar oil, which has previously been mixed with about one fourth its weight of sulphuric acid, to prevent the formation of an explosive composition.

The pasty mixture, produced as above described, is combined with caoutchouc, or eqvivalent gum, in the proportion of about three ounces of the paste to a pound of gum, the proportion of gum being increased if a more elastic product is desired. After the gum and paste are thoroughly incorporated, the composition may be hardened by subjecting it to a dry heat (of from 200° to 320° Fah.), for from ten minutes to one hour and a half, the time being lengthened to increase the toughness of the product.

The product thus obtained may be applied to many useful and ornamental purposes, and any desired color may be imparted to the material by combining with the composition, before it is hardened, any suitable mineral or earthy coloring matter.

Manufacture of Carpets and other Fabrics from Jute, Flax, etc.

Thomas Crossley, of Bridgeport, Conn., has obtained a patent as above, the process being as follows:

"The cloth, after being woven from the raw jute, flax, or cotton, is immersed in a bath of water, at, say, from 90° to 120° Fahrenheit, in which has been mixed a certain portion of either wheat or corn bran, and sub or bicarbonate of soda. After remaining in this bath for a length of time sufficient to thoroughly dissolve the tannin in the jute or cotton, or the gluten or gum in the flax, I then remove the cloth and wash it thoroughly in clean water, and I afterwards immerse it in a bath of cold water, mixed with a solution of crystallized tin and muriatic acid, or strong muriate of tin, with twenty per cent of sulphuric acid, at a strength of from one to two degrees Twaddell. After impregnating the cloth with this bath, it should be again washed in clean water, and then submitted to a bath of weak solution of chloride of lime, after which the cloth is so washed clean and dried, and it is then ready for printing or dyeing.

"By these means I am enabled to produce a carpet or other fabric, dyed or colored in any colors or design, by the process of dyeing or printing, without weakening or injuring the strength of the fibers, and at the same time to produce a carpet or other fabric, having all the richness and style of woolen or worsted goods, with equally durable colors, but at much less cost."

Recutting Files with Acids.

There are many recipes for converting old files into new by means of acids, and among the latest is that recently patented as follows, by Albert I. Ferguson, of Sharon, Pa.:

"The files must be thoroughly cleansed in warm water containing a small quantity of potash, which readily removes any grease or dirt from them. After the files are thus cleansed, they must be washed with warm water and dried by artificial heat. Next, place one pint of warm water into a wooden vessel, and put into it as many files as the water will cover. Then add two ounces of blue vitriol, finely pulverized, and two ounces of borax, well mixed, taking care to turn the files over, so that each may come in contact with the mixture. To the above mixture now add seven ounces of sulphuric acid and one fourth of an ounce of cider vinegar, which will cause the files to assume a red appearance at first, but they will, in a short time, resume their natural color. Then they must be removed, washed in cold water, and then dried by artificial heat. When dry, they must be sponged with olive oil, wrapped in porous paper, and laid aside for use."

Improvement in Combs.

Elias Brown, of Wappinger's Falls, N. Y., has lately received a patent for a valuable improvement as above, which is coming into extensive use. The combs are stamped by a peculiar machine out of sheet steel, the mechanism being of such a nature as to leave the teeth of the comb rounded and smooth. The combs are then tempered and afterwards ornamented with an enamel which gives them a very soft and beautiful appearance. In weight they are about the same as rubber, over which they have several important advantages, such as freedom from odor, greater elasticity, cheapness, and durability. The agents are Noyes, Wilson & White, 98 Franklin street, New York. Mr. Brown's large factory for the manufacture of these new combs was lately burned down at Wappinger's Falls. But he is rebuilding with characteristic energy, and will soon be in full operation again. He is the first, we believe, to make a really superior comb from steel.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING FEBRUARY 4, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

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On issuing each original Patent	$20
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In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

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73,942.—Cooking Stove.—Federal C. Adams and Joseph Peckover, Cincinnati, Ohio.

We claim, 1st, The horizontal concentrating plate, A, stationary or movable, and with or without fuel doors, substantially as and for the purposes described.

2d, The flap or guard plate, B, whether stationary or movable, substantially as and for the purposes described.

3d, The spaces between the fire back and sides and the front oven and side plates in combination with the plate, A, substantially as described.

4th, The chamber above the top oven plate and below the top flue formed by plates, C and C', substantially as and for the purpose described.

5th, The hollow or double fire-back, Q, substantially as described.

6th, The air chamber under the grate and ash pot formed by the false bottom, I, substantially as described.

7th, The chamber between the front oven plate and fire-back in combination with the open-grate frame and plate, A.

8th, The hollow side plates, S S', substantially as described.

9th, The register, R, in combination with the fire-back and front oven plate, substantially as described.

10th, The register, N, in combination with the open-grate frame, substantially as described.

11th, The sliding lid, A a, in combination with a cooking stove, substantially as described.

12th, The rolling hearth plate, D d, operating substantially as described.

13th. The hearth plates, E e, sliding laterally under the bottom plate, substantially as described.

73,943.—Printing Press.—Edwin Allen, Norwich, Conn., assignor to the Allen Manufacturing Company.

I claim the rotary press herein described having one of its driving wheels, F1, provided with one or more adjustable segments or racks, F2, substantially as and for the purpose set forth.

73,944.—Vise.—Samuel S. Barnaby, Macon, Ga. Antedated November 23, 1867.

I claim, 1st, The combination of the sliding bar, H, ratchet-jaw shank or bar, E, and pawl, M, when arranged together substantially in the manner and so as to operate as and for the purpose described.

2d, The combination with the eccentric V and sliding sleeve, S, of the pawl, M, arranged together and connected with the jaw shank or bar, E, substantially as and for the purpose set forth.

3d, An improved vise constructed and arranged in its several parts substantially as described and so as to be operated as specified.

73,945.—Cultivator.—F. M. Barrier, Stevenson, Ala.

I claim the construction, arrrngement, and combination of the central beam, A, with its shovel or plow, the side beams, C C', with their shovels or plows, the U or arched-shaped brackets, E E, and braces, a a, all as and for the purpose described.

73,946.—Inkstand.—James Barwick, Silvertown, North Woolwich, England.

I claim, 1st, The combination with an ink reservoir and cup of a valve for holding and discharging the ink which the cup may contain said valve being arranged within the reservoir so as to close against the bottom or under side of the cup, substantially as herein shown and described.

2d, The combination with the ink reservoir, dipping cup and valve, arranged as above described of a valve rod passing centrally or axially through the said cup, substantially as and for the purposes set forth.

3d, The combination with the ink reservoir, cup and valve of a hollow valve-operating stem extending from within and near the bottom of the reservoir up through and above the bottom of the ink cup, substantially as and for the purposes shown and described.

4th, The combination with the ink reservoir, dipping cup and valve of a rubber sleeve or other device for holding the valve against its seat with a yielding pressure, substantially in the manner herein shown and specified.

5th, In an inkstand organized substantially as herein shown and described providing the valve stem, when hollow, with discharge openings within the capacity of the ink cup and above the intended level of the ink held in the same, substantially as and for the purposes shown and specified.

6th, The combination with the closed ink reservoir, the elastic bulb, or equivalent device for compressing the air within the same and the ink cup, of a tube or conduit opening from the reservoir into the cup at a point above the bottom of the latter and a valve for holding and discharging the ink contained within the cup, substantially as and for the purposes shown and specified.

73,947.—Drawing Clamp.—Jules Bouniol, Philadelphia, Pa.

I claim the wire and tube drawing device consisting of the frame, A B, with rollers, C D, which have cams or jaws, g h, cog wheels, H I, double joint or hinge, E F, and hook, G, substantially as and for the purposes described.

73,948.—Photographic Printing Apparatus.—Edwin Brown, Roxbury, and Edwin W. Brown, assignors to Edwin W. Brown, Boston, Mass.

We claim, 1st, So connecting a frame suitable for sketching photographic prints to and with any proper operating mechanism that such frame will be moved over and across the picture as it is being printed, substantially as and for the purpose described.

2d, Also the rod, F, carrying the sketching frame and guide, M, or their respective equivalents, in combination with each other and when so arranged together and with reference to the operating mechanism as to impart to the frame the movement requisite for sketching, substantially as described.

73,949.—Stateroom for Railroad Cars.—William Brown, Duncannon, Pa.

I claim the combination of the hinged doors, c, with the passage way or entry, C, so that the latter may be inclosed and made to form a portion of the staterooms when desired, substantially as described.

73,950.—Car Brake.—John A. Campbell (assignor to himself and David Sharp), South Boston, Mass.

I claim the combination as well as the arrangement of the two screws, e f, of the transom-bolt, C, with such bolt, the bars, a c, and the two series of brakes applied to such bars and the wheels or to the same and the platform, A, substantially as described.

And in combination therewith the hand wheel shaft, m, its gear, l, and chain or belt, k, and the gear, i, on the transom-bolt, C, the whole being arranged substantially in manner and so as to operate as described.

73,951.—Steering Apparatus.—James L. Cathcart, Georgetown, D. C.

I claim the jointed propeller so arranged in connection with the rudder as to be capable of lateral motion for steering purposes in unison with the rudder by power transmitted through the latter and of being disconnected therefrom and secured in its normal position, substantially as herein described.

73,952.—Horse Rake.—Abner Chapman, Delta, N. Y.

I claim a grain head applied to the arms of a revolving horse rake, marked B, in the manner and for the purpose herein set forth.

73,953.—Case for Tooth Paste.—George F. J. Colburn, Newark, N. J.

I claim the case, D, to be used in combination with the tube, B, and with or without the sack, A, and the application of the whole, as and for the purpose specified.

73,954.—Lifting Jack.—John Coulter, Sen., Xenia, Ohio. Antedated January 31, 1868.

I claim the combination and arrangement of the standards, C C, horizontal sliding bar, B, vertical bars, d d, windlass, E, with its toothed wheels, F F, and ratchet lever, G, toothed wheel, I, and pawl, H, constructed substantially as shown and described

73,955.—Shuttle for Looms.—E. Cross, Southbridge, Mass.

I claim the combination with the tip and wood of the shuttle of an interposed shield, C, arranged with relation to the tip and the shuttle wood, substantially as and for the purposes set forth.

73,956.—Pen Wiper.—Samuel Darling, Bangor, Me.

I claim, 1st, A pen-cleaning apparatus so constructed as that the pen may be first dipped in water and then be cleaned against a brush hung free to revolve, substantially as set forth.

2d, The combination with a water cup or vessel of a circular brush free to revolve therein, as and for the purpose described.

3d, The combination with such a cup of a revolvable brush set at an angle with the cup, substantially as and for the purpose described.

4th, The removable cover having secured thereon one of the bearings or centers for the brush.

5th, The combination with a pen washer of a wiping reel, as and for the purposes described.

6th, A pen cleaner having a brush, circular or otherwise, to be used wet or dry, in combination with a wiper made of wash leather, cloth, or their equivalents, for the purpose herein set forth.

73,957.—Gas Heater.—Samuel Darling, Bangor, Me.

I claim the combination with the tube of a "gas heater" of flame-confining guides, substantially as described.

73,958.—Safety Harness Hook.—J. L. Dickinson, Dubuque, Iowa.

I claim a safety harness hook for liberating horses from carriages, constructed and operating substantially as herein shown and described.

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73,959.—RAILWAY FROG.—J. Hall Dow and Daniel J. Riker, Chicago, Ill.

We claim, 1st, The chair, C, constructed substantially as and for the purpose specified.

2d, The point, g, having its upper and lower edges bevelled in combination with the chair, C, constructed substantially as and for the purposes specified.

3d, The wings, e f, when provided with the two bevelled edges in combination with the point, g, and chair, C, all constructed and arranged substantially as and for the purposes specified.

73,960.—EGG-PRESERVING FRAME.—Christopher A. Erskine, Palermo Centre, Me.

I claim the said egg-supporting frame substantially as described as made not only with its trays provided with ledges at their ends and without any at their sides but as having the tie bars arranged with respect to such trays in manner and so as to operate as and for the purposes as set forth.

73,961.—STRAW CUTTER.—William H. Evans and William H. Wainwright, Indianapolis, Ind.

We claim, 1st, The combination of the eccentric shaft, I, pawls, L and M, ratchet wheels, O and O', rollers, D and D', and the adjustable eccentric, R, constructed and arranged substantially as set forth.

2d, The combination of the boxes, B and B1, and plates, B2, constructed as described.

3d, In combination with the boxes, B and B1, and knife, E, the cutting bar, C, adjustably attached by eccentric bolts, substantially as described.

73,962.—LOOM INDICATOR.—Alfred Fellows, Thos. B. Harrison, and Hugh Dyer, Maquoketa, Iowa.

We claim, 1st, The cylinder, C, pin, D, and shaft, B, and spur, E, constructed, arranged, and operating as and for the purpose described.

2d, The combination of the bevel wheels, G and F, arbor, H, the ratchets, O and N, with their hollow arbors, dial, K, and hands, P and L, arranged and operating as described.

3d, The combination of the rod, Z, lever, A", spring, B", lever, W, pawl, Y, and ratchet wheel, O, arranged and operating as described.

4th, The shaft, E", button, F", and pinion, D", arranged and operating as above described.

5th, Operating the lever, W, by means of a flexible cord attached to the lay or batten of the loom, as described.

6th, The measuring device, constructed as described, in combination with the clamp and screw, H".

7th, The combination of the wheel, G, pin, R, lever, S, spring, U, pawl, T, and ratchet wheel, N, arranged and operating as described.

73,963.—NUMBERING MACHINE.—Walter H. Forbush, Buffalo, N. Y.

I claim, 1st, A registering pawl, G, striking radially, or nearly so, into the external registering notches, D, of the disks, after each movement thereof, thereby bringing said disks into strict alignment.

2d, The system of steps, g3, on the registering pawl, G, working in combination with the steps of the changing pawl, E, substantially as set forth.

3d, The mechanism consisting of the cam, I, arm, H, and fixed plate, J2, or the equivalent thereof, for giving the in, down, out, and up movement to the changing pawl, E, as and for the purpose set forth.

73,964.—CAR COUPLING.—John Fortier, Fairport, N. Y.

I claim the combination of the spring, E, with the inclosing slide, D, and case, f, arranged in such a manner that the spring acts by the tension of its main body and compression of its parts, k k, simultaneously to resist the thrust of the coupling link, substantially as set forth.

73,965.—MANUFACTURE OF ARTIFICIAL STONE, STUCCO, CEMENT, ETC.—Geo. A. Frear, Chicago, Ill.

I claim the use of an aqueous solution of shellac in the production of artificial stones, cements, stucco, etc., for useful and ornamental purposes.

73,966.—TOY GUN.—Russel Frisbie (assignor to J. E. Stevens & Co.). Cromwell, Conn.

I claim the spring, E, with the clutch hub, D, rod, F, pebble socket, J, trigger, B, substantially as and for the purpose described.

73,967.—WETTING OR WIPING INSTRUMENT FOR SLATES, etc. Wm. T. Fry (assignor to G. H. Jones and H. C. Berlin), New York city. Antedated Jan. 23, 1868.

I claim a vessel, A, having openings in the end, through which pass fibrous strands, d, in combination with a sponge, G, with which the strands are in contact, the whole being arranged substantially as specified.

73,968.—WETTING OR WIPING INSTRUMENT FOR SLATES, etc. W. T. Fry (assignor to G. H. Jones and H. C. Berlin), New York city. Antedated Jan. 24, 1868.

I claim, 1st, An instrument consisting of a casing for containing water, one end of the casing being provided with a sponge, or its equivalent, communicating with the water, and the other end with a sponge to which the water cannot gain access, the whole being constructed substantially as and for the purpose herein set forth.

2d, The enlargement, c c, at opposite ends of the case, for the purpose specified.

73,969.—PUMP PISTON.—S. P. Gilbert, Racine, Wis.

I claim the ring, I, holding the packing, E, and forming a valve for the ports D, all substantially as and for the purpose set forth.

73,970.—APPARATUS FOR TURNING THE LEAVES OF MUSIC.—Thos. Goodrum (assignor to Wm. E Green and Charles W. H. Day), Providence, R. I.

I claim the ratchet plate, F, hinged to and operated by the spindle, C, and lever, I, in combination with the fingers, for turning over the leaves of music books, substantially as shown and described.

73,971.—HORSESHOE.—Wm. T. Harmar, New York city.

I claim the steel toe cork or sharp, attachable to any smooth horseshoe by means of a clip, or flexible metal straps; also, an iron, or other metal, snow plate, attachable to the shoe by means of the clip and hole and leather loop and strap.

73,972.—SEEDING CULTIVATOR.—M. Hayden, Detroit, Mich.

I claim, 1st, The springs, L, when arranged and operating substantially as and for the purposes set forth.

2d, The arrangement of the treadle or vibrating lever, W, the arm, V, and rod, X, provided with the adjustable screws and nuts, the pins, Y, and the cars, Z, for the purpose described.

3d, The covering shovels, G, provided with a proper spring, when operating substantially as and for the purposes specified.

4th, The combination and arrangement of a seeding cultivator, combining the above recited parts, with the frame, A, the wheels, B, the bars of the frame, C, the bar behind the rear bar, C, the hollow standards, E, hung upon the bars, D, the shovels, F, and covering shovels, G, the hinged joints, H, the braces, I, clasps, J, the adjusting slotted plates and bolts, K, the slotted projections, M, the bolts, P, the lever, Q, the arm, R, the quadrant, S, the pitman arm, T, the rocking bar, U, the vibrating lever or treadle, W, with its attachments, the gear wheel, 2, the pinions, 3 and 4, and lever, 5, and the shaft, 6, when constructed and operating substantially as herein set forth.

73.973.—SEEDING MACHINE.—M. Hayden, Detroit, Mich.

I claim. 1st, The construction of a seeding machine provided with the shatt B, the grooved cylinder, E, the collar, P, provided with the gage prongs, F, and the sleeve, D, when constructed and operating substantially as herein-before described.

2d, The quadrant, H, the lever, I, the segment rack, J, and the plate. L, when attached and operating substantially as and for the purposes set forth.

3d, The combination of all the foregoing described parts, in conjunction with the hopper or seed box, A, when constructed and operating substantially as and for the purpose specified.

73,974.—DENTISTS' FLASK.—G. E. Hayes (assignor to Buffalo Dental Manufacturing Co.), Buffalo, N. Y.

I claim, 1st, The process, substantially as herein described, of filling vulcanizing flasks, or the molds contained therein, by constructing the flask with a side opening, a, and forming a cavity, b, in the mold by a plunger, E, combined or connected in a direct manner with said flask, and after having first packed the mold proper, also, the cavity, b, communicating therewith, with rubber and closing the flask, projecting the plunger through the cavity in the flask to press upon the rubber, substantially as specified.

2d, The molds, C and D, provided with an enlarged cavity, b, in communication with a side opening, a, made in the flask for reception of a portion of the requisite amount of rubber necessary to fill the mold, essentially as herein set forth.

3d, The combination, with a vulcanizing flask having a side opening, a, in it, of a plunger, E, for operation therein, substantially as specified.

73,975.—DRAWER.—Henry Heath (assignor to H. G. Fish, T. R. Clark, and T. J. Flagg), New York city.

I claim the combination of the pointed waistband of the drawers with a full leg, having triangular portions removed from its upper end, so as to obtain the requisite fullness at the hips and waist without the necessity of gathers.

Also, the combination of the ankle band of the drawers with a full leg, having a triangular portion removed from its lower end, so that the requisite fullness of the legs is secured without a surplus of material in the vicinity of the ankle.

Also, the combination of the pointed waistband of the drawers, ankle band and full leg having triangular portions removed at both ends, substantially as set forth.

73,976.—POSTAL SCALE.—Marcus L. M. Hussey, New York city.

1 claim, 1st, The revolving dial, i, upon which are inscribed mail routes and postal rates, substantially as described and for the purposes specified.

2d, The combination of the revolving dial, i, upon which are inscribed postal rates and mail routes, with the spring, or other equivalent weighing balance, substantially as and for the purpose described.

3d, The combination of the dial, i, or a segment thereof, with the adjustable indicator, o, when constructed substantially as described.

4th, The vertical indicator, when used in connection with a revolving dial, or a segment thereof, for the purposes specified.

5th, The vertical indicator, in connection with a spiral spring balance, for the purposes specified.

73,977.—COLLAR BLOCK.—John Jacobs, Oneida, Ill. Antedated Jan. 24, 1868.

I claim, 1st, The use of the right-and-left screw shaft, K, provided with the nuts, o o, and arms or rods, J J, for expanding or contracting the parts, B B, substantially as herein set forth.

2d, The arrangement of the shaft, H, pinions or gear wheels, I and T, and shaft, K, for expanding and contracting the former, and at the same time moving the platform, C, substantially as specified.

3d, The arrangement of the pincers, E, upon the platform, C, and with the arms, e e, links m' m, and the lever, d, as and for the purpose set forth.

73,978.—WASHING MACHINE.—Martin V. Jennings, Centralia, Mo.

I claim the combination, in a washing machine, of the corrugated washboard, e e' e", etc., with an adjustable dasher, w, when the same are arranged constructed and operated substantially as shown and specified.

73,979.—CORN CULTIVATOR.—N. S. Johnson, Maquoketa, Iowa, Antedated Feb. 1, 1868.

I claim, 1st, 1st, The combination of the two axle bars, B B, and the four upright standards, A A A A, and cross beam, S, and bolts, E.

2d, The combination of the seat board and seat level, I, with the levers, L L, shovel beams, D D, and the movable pivot or standard, C, substantially as and for the purpose herein specified.

73,980.—COMPOUND FOR DESTROYING BURRS IN WOOL.—W. H. Jubb, Norwalk, Conn.

I claim the use and combination of the ingredients, as herein described, for destroying the burrs in wool and bleaching the wool, substantially as and for the purpose set forth.

73,981.—FLOUR BOLT.—E. H. Kellogg, Mukwonago, Wis.

1 claim, 1st, Attaching the bolting cloth, one edge to the outside and the other to the inside of the ribs of each square of a bolting reel, as described.

2d, Inclines, H, in combination with arms, E, and ribs, F, of a bolting reel, substantially as and for the purposes described.

73,982.—WASHING MACHINE.—Dan'l Lampson, Lyons, Iowa.

I claim the hollow cylinder, B, encased with ends and slats, as above set forth.

2d, The combination and arrangement of the hollow cylinder, B, the slats, d, the corrugated trough bottom, when constructed, arranged, and operating substantially as and for the purposes set forth.

73,983.—MODE OF FORMING PLOW LAYS.—John Lane, Chicago, Ill.

I claim the method herein described of making plow lays, that is to say, by first reducing by means of rolls a slab of steel along its center, from end to end, to the shape described, then slitting said slab along the line of its greatest depression, and afterwards cutting the same crosswise, in suitable lengths for plow lays, as set forth.

73,984.—CAR COUPLING.—Sam'l D. Lecompte, Leavenworth County, Kansas.

I claim the combination of the pivoted swinging bar, d, and the spring, e, hinged at f, in connection with the double slotted bolt holder, B, and shank-headed bolt, O, when constructed and arranged substantially as and for the purpose described.

73,985.—WOOD TURNING LATHE.—Geo. Lewis, Westfield, O.

I claim the combination of the reciprocating vibrating carriage, R, cutter head, W', cross piece, U, standards, X C, spring, A', adjustable arms, Y D', lever, F, and weights, Z E, all constructed, combined and arranged in relation to the pattern, Q, and spoke, P, and operating in the manner and for the purpose substantially as set forth.

73,986.—CARPET STRETCHER.—C. S. McRobert, Plymouth, Mich.

I claim, 1st, The rack, I, and hooked sliding pawl, J, in connection with levers, C and A, when constructed and operating substantially as and for the purposes set forth.

2d, The combination of the above named parts with the crotchet lever, A, provided with the transverse bar, B, the levers, C and D, provided with transverse bars, E and F, and teeth, as hereinbefore described, and the adjusting pins, G and H, when arranged substantially as and for the purposes herein described.

73,987.—WINDOW BLIND FASTENING.—George B. Melcher (assignor through mesne assignments to John Kingsman), Salem, Mass.

I claim the aforesaid rotary slide button, as made with a slot, B, projection, g, notch, d, and convex face, e e, substantially as described.

73,988.—CORN AND COTTON CULTIVATOR.—James W. Milroy, Galveston, Ind.

I claim the movable arms, D D, toggle jointed lever, E, beam, C, notched lever, F, rod, G, key, g, circular frame, A, and self-adjusting hoe shovels, B B B B, the whole as constructed and arranged substantially in the manner and for the purpose set forth.

73,989.—FRUIT PICKER.—Oel B. Moore, Walled Lake, Mich.

I claim 1st, The form of the instrument.

2d, The application of the loops A and B.

73,990.—STOVE DRUM.—M. S. Morgan (assignor to himself and George C. Coffee), Clintonville, Ill.

I claim rotating case, A, in combination with soot box, L, scrapers, H and H", substantially as and for the purpose described.

73,991.—ARTIFICIAL LEATHER.—Louis Montier, N. Y. city.

I claim, 1st, The process herein shown and described of combining the refuse shavings of leather to make artificial leather.

2d, Water proof artificial leather, when made and coated, substantially in the manner and with the ingredients hereindescribed and set forth.

73,992.—CARRIAGE JACK.—Calvin H. Paine (assignor to himself and George S. Thompson), Providence, R. I.

I claim the arrangement and combination of the lever, D, and toggle, E, with the slide bar, C, and the base board, B, applied to the standard, A, substantially as specified.

Also, The pin, g, as made with the brace or arm, m, extended from it as set forth.

73,993.—LET-OFF AND TAKE-UP FOR LOOMS.—John Pender, Worcester, Mass.

I claim, in combination with the yarn and cloth beams, or either of them, and with the mechanism by which the intermittent rotative movement of the yarn or cloth beam is directly produced, the lever or levers, i, pawl or pawls, u, and arm or arms, v x, arranged to operate substantially as set forth.

73,994.—APPARATUS FOR SEPARATING SOAP BARS.—Harvey Phelps and Alvah Phelps. Albany, N. Y.

We claim the application to soap cutting apparatus of a carriage, E, having an accelerated motion with relation to the slab feed, D, for the purpose set forth.

73,995.—CALCULATING MACHINE.—A. C. Pierson, Rahway, N. J.

I claim, in combination with the table, N, or its equivalent, having the interest or other calculations for given amounts entered as represented, the parallel bar, B, with or without the adjustable movable pieces, c, or their equivalents, adapted to operate in connection with the numbers in the table, N, or its equivalent, substantially in the manner and for the purpose herein set forth.

2d, In combination with the above, carrying on the parallel bar, B, the line of figures or other marks, P, indicating the amounts for which the interest or other calculations is to be computed at the several points, substantially in the manner and so as to realize the advantages herein set forth.

3d, In combination with the column of days, the belts or moving columns, G and H, carrying the dates in a reverse order, so as to allow the length of time to be ascertained from a given day, reckoning either forward or backward, substantially as and for the purpose herein set forth.

4th, The belts or sliding columns, G and H, having the dates in reverse order, as shown, in combination with the interest table, n, as and for the purpose herein specified.

73,996.—WASHING MACHINE.—J. F. Pond, Cleveland, Ohio.

1 claim, 1st, The application of friction guide pieces, i, attached to the edge of the endless apron or belt, to prevent the apron from turning under or over, and getting out of place, as and for the purpose specified.

2d, The adjustable slides, b b, attached to the upright pieces, B B, by means of bolts or screws, as and for the purpose specified.

73,997.—BED BOTTOM.—James Potter, Portland, Me.

I claim, 1st, The spring as shown at b, in connection with the recesses, m' m', in the slats, b', as and for the purposes set forth.

2d, The spring joints, a, in the slat, B, as and for the described purposes.

3d, In combination with a bed slat, removable by means of the spring, b, the arrangement of pivots, t, and hinges, s, as and for the purposes described.

73,998.—LIME KILN.—Wm. W. Potts, Bridgeport, Pa.

I claim, 1st, Arching over the upper end of the kiln, A B, substantially as described, and covering the feed hole, a', left thereby, by means of a removable cover, a", provided with the small vent hole, a"', substantially as and for the purpose described and set forth.

2d, The combination of the furnaces, C, and the channels, D and E, when the same are constructed and arranged in the relation to each other and to the kiln, A B, as described and set forth, for the purposes specified.

3d, Forcing the currents of air up through the lower part of the kiln, and onward therein, by means of the channel, F, substantially as and for the purposes described.

73,999.—DOOR SPRING.—L. C. Prindle, Chicago, Ill.

I claim a door and gate spring, cut in the form shown, and coiled so as to have projections, F and G, in combination with plates, E H, substantially as and for the purposes herein specified.

74,000.—BRICK MACHINE.—L. E. Ransom, Trenton, Mich.

I claim the construction of the apparatus as hereinbefore described, combining the frame, A, the rollers, B and C, the crank, D, the gears, E and F, the sides or shields, G, the sloping shelf, H, the scraper, I, the wheels, J, and the knife, K, with the stand, L, all arranged and operating substantially as and for the purposes herein described.

74,001.—PROCESS OF GENERATING GASES AND IN THE APPLICATION OF THE SAME.—John T. Rich, Philadelphia, Pa. Antedated Jan. 23, 1868.

I claim, 1st, The process of generating and procuring the partial decomposition of atmospheric air by the action of wet steam in contact with mesallic or other hard substances, for the purposes set forth.

2d, The process, substantially as described, of saturating atmospheric air, and the subsequent application of the same to the purposes of chemical distillation, or mixed with carbon or hydrocarbon vapors to heating or illuminating purposes.

3d, The process of generating and preserving oxygen gas by the action upon a current of atmospheric air or electricity, evolved by a jet of wet steam, and the consequent separation of the steam and nitric acid from the oxygen thus set free, substantially as set forth.

4th, The mode of manufacturing, illuminating and heating gases by mingling hydrocarbon gases or vapor with oxygen gases, generated substantially in the manner set forth.

5th, The mode of manufacturing mingled oxygen gases for use in the desulphurization of ores, etc., substantially as set forth.

74,002.—DEVICE TO PREVENT HOGS FROM ROOTING.—L. L. Rinehart and P. Phillips, Evansburg, Ohio.

We claim the strip, A, with arms, a a, bent, B, spring, C, pin, c', arms, d, and roller, D, when combined and arranged substantially as described.

74,003.—CENTER BOARD FOR VESSELS.—Duncan Robertson, Detroit, Mich. Antedated Dec. 12, 1867.

I claim the combination and arrangement of the iron center board, A, the journals, C C, the eyebolts, a a, the ropes or chains, D D H H, the hollow stanchions, E E I I, and the stops, G G, arranged substantially as described, for the purpose designed.

74,004.—CULTIVATOR TEETH.—Luman Rogers, Pittsburg, Pa. Antedated Jan. 23, 1868.

I claim, 1st, The rib, b, on the back of cultivator teeth, or of blades for shovel plows, for the purpose of adding strength to the blade, or of forming a means for attaching it to its standard or frame.

2d, Attaching cultivator teeth or blades of shovel plows by means of a bolt inserted into a rib or projection on the back of the tooth, which fits into a recess or groove in the standard or frame, substantially as and for the purposes described.

74,005.—COTTON PLOW AND CULTIVATOR.—Andrew Runstetler and Albert Windeck, Peoria, Ill.

We claim the construction, combination and arrangement of the frame pieces, A B C, the iron gage pieces, D E F, hook and ring, and removable shovel, M, attached to the beam or piece, B, all as shown and for the purposes described.

74,006.—COTTON SCRAPER AND CUTTER.—Andrew Runstetler and Albert Windeck, Peoria, Ill.

We claim, 1st, The mode, substantially as set forth, of adjusting the scrapers, c c, by means of curved irons, h h, connected with the regulator, I.

2d, The combination of a driver's seat, the levers, M and L, for controlling the action of the revolving hoes, H H, and the regulator, I, for controlling the scrapers, substantially as set forth.

74,007.—TREADLE FOR PROPELLING SEWING MACHINES.—Benj. Rutter and Hixson Hunt, New Lexington, Ohio.

We claim the construction of the top of a sewing machine stand, with a fulcrum, G, and balance lever, F, in combination with the treadles, A and C, bar B, crank D, and rods E E, substantially in the manner and for the purpose as herein set forth.

74,008.—SAFETY POCKET.—Cyrus Sanborn, Chichester, N.H.

I claim the said improved safety pocket, consisting of the case, A, secured to the apparel, into which the case, C, is arranged to slide and fasten, substantially as herein set forth.

74,009.—CARRIAGE SPRING.—J. D. Sarven, Columbia, Tenn.

I claim the combination of the steel springs, D, rubber springs, E, and curved plates, C (having flanges or ears formed upon their side edges), with each other, and with the springs and body of the vehicle, substantially as herein shown and described, and for the purpose set forth.

74,010.—CARRIAGE SPRING.—J. D. Sarven, Columbia, Tenn.

I claim the combination of the metallic plate or cap, B, having flanges, b', upon its sides and outer end, and the rubber spring or angular block, C, with the end of the wooden spring, A, substantially as herein shown and described and for the purpose set forth.

74,011.—ELASTIC BEARINGS FOR BODY-SUPPORTING IRONS FOR CARRIAGES.—James D. Sarven, Columbia, Tenn.

I claim the method of fastening the iron head, D, in the box, B, as above described, by means of vertical grooves, e e, in the side of the head, in connection with vertical projections in the box, or by means of a vertical bolt, G, passing through the center of the box, substantially as and for the purpose specified.

74,012.—ELASTIC BEARING FOR THE BODY SUPPORTING IRONS FOR CARRIAGES.—James D. Sarven, Columbia, Tenn.

I claim, 1st, The supporting iron, D, having the neck, d, and the head, D', as and for the purpose specified.

2d, The combination of the springs, A A, one or both, cushions, I F, and cross-bars, B, substantially as and for the purpose described.

3d, The combination and arrangement of the box, E, with the enclosed cushions, I F, substantially as and for the purpose specified.

74,013.—SHUTTLE FOR LOOMS.—Levi Scofield, Farmington, Wisconsin.

I claim constructing a shuttle for weaving cloth, with the orifices, d and e, substantially as and for the purpose described.

74,014.—BOOK BINDING.—Henry M. Shute, Waukegan, Ill., assignor to George W. Emerson.

I claim the wire, C, figs., 1, 2 and 3, in combination with the flattened wires, e, figs., 1 and 2, one or more, or their equivalent, substantially as and for the purpose set forth.

74,015.—LETTER BOX.—John W. Smith and Jas. D. Smith, Washington, D. C.

We claim the arrangement of the cylinder, C, coiled spring, D, pulley, E, chain, F, and cover, G, with the trough, B, when constructed on the top of the lid or cover, A, substantially in the manner and for the purpose as herein set forth.

74,016.—HARVESTER.—Jno. W. Thompson, (assignor to Elvira A. Thompson,) Greenfield, Mass.

I claim, 1st, The combination of the shipper, consisting of the sleeve, G, having the hand wheel, d, and threads upon it, with the frame, A A, arranged so as to slide upon the carriage axle, substantially in the manner and for the purpose shown.

2d, The pawl having the cup, q, with spring, u, and nut, t, arranged and constructed substantially as shown.

3d, The cutter bar frame, E, consisting of the pieces, f and g, with cross strips, 1, 2, 3, &c., formed as shown.

4th, The arrangement of the gear wheels, a and J, upon the bar, C, so that the pressure upon the latter is equalized, substantially as shown.

5th, The peculiarly shaped cutter, having the projections, k k k, &c., in combination with the cutter bar, consisting of the two plates, P and R, and adjusted by the nuts, m m, &c., substantially as and for the purpose described.

74,017.—CONSTRUCTION OF FENCE.—Asahel Todd, Jr., Pultneyville, N. Y., assignor to himself, A. F. Sheldon, John S. Todd, T. S. Ledyard and L. S. Cuyler.

I claim, 1st, The herein described method of attaching and detatching the pickets from the wires by means of the clasp, K, fig. 7, or their substantial equivalents, in the manner specified.

2d, The clasp, K or L, or equivalent, in combination with the wires, C C', posts, A, pickets, N, and brace wire, M.

3d, The metallic bracket, D, cap, E, in combination with the posts, A, wires, C C', brace wire, M, and pickets, N.

4th, The brace wire, M, in combination with the posts, A, wires, C C', bracket, D, cap, E, and clasp, K.

5th, The temporary post, A', in combination with the wires, C C', brace wire, M, bracket, D, cap, E, clasp, K, substantially as and for the purposes set forth.

74,018.—CONSTRUCTION OF FENCE.—Asahel Todd, Jr., Pultneyville, N. Y., assignor to himself, A. F. Sheldon, J. S. Todd, T. S. Ledyard, and L. S. Cuyler.

I claim, 1st, The jointed double acting lever, D.

2d, The detachable indexes, K and H H', in combination with the double-acting lever, D, and guide, I.

3d, The detachable guide, I, in combination with the lever, D, and indexes, K and H H', substantially as and for the purposes set forth.

74,019.—CASTER.—Alexander C. Twining, New Haven, Conn. Antedated January 8, 1868.

I claim the spring catch attached to the carriage, as described, in combination with the groove or slot around the interior of the socket, all substantially as described and for the purposes set forth.

74,020.—LANTERN GLOBE.—William Westlake, Brooklyn, N. Y.

I claim a lantern globe, made of or finished into a single piece, having one portion colored and a part clear, substantially as specified.

74,021.—MACHINE FOR SEPARATING LIQUIDS FROM PAINTS AND OTHER SOLID SUBSTANCES.—David M. Weston, Boston, Mass.

I claim the revolving cylinder, F, without openings or perforations in the circumference, substantially as described.

Also, the cylinder, F, in combination with the passages or outlets, or their equivalents, at A, in the hub and bottom, substantially as described.

Also, the breakwater, E, or its equivalent, in combination with the cylinder, F, substantially as described.

74,022.—LETTER GAME.—James E. Wheat, Rochester, N. Y.

I claim the application of letters or figures to a series of stakes or pins, to be arranged suostantially as herein shown and described, for the purpose of constituting a parlor or a yard play or game, as set forth.

74,023.—HORSE RAKE.—John R. Whittemore, Chicopee Falls, Mass.

I claim the device for operating the teeth of the rake, consisting of the double armed lever, E, fulcrumed at L, and connected to the arm, K, by means of the link, I, hinged at its elbow at H, the parts being arranged substantially as herein shown, and for the purposes set forth.

74,024.—COMBINED PLOW AND HARROW.—Philander Wonsey, Ogden, N. Y.

I claim the combination of the harrow, scraper, and plow, and the manner in which they are attached and detached.

74,025.—VISE.—Linus Yale, Jr., Shelburne Falls, Mass.

I claim, as of my own invention, the combination of a spring with the jaws, nut, and screw of a vise, substantially in the manner and operating as specified.

74,026.—BRUSH STOCK AND HANDLE.—Albert A. Young, (assignor to himself and George T. Dalton,) Boston, Mass, Antedated January 16, 1868.

I claim, 1st, The combination and arrangement of the circular plate, D, with the plate of the handle, E, whereby the handle is placed at right angles, and also diagonally to the body of the brush, substantially in the mauneran.l for the purpose above set forth.

2d, Also, the combination and arrangement of the hinge, F, with its swiveling abutment, b, the turning screw, c, and the spring bolt, G, whereby the handle is raised and secured perpendicular to the body of the brush, substantially in the manner and for the purpose above set forth.

3d, Also, the combination and arrangement of the brush handle, B, with the other parts of the brush, whereby the handle may be used in a diagonal, reversible, and perpendicular position, and also at right angles with respect to the body of the brush, substantially in the manner and for the purpose above set forth.

74,027.—BRUSH STOCK AND HANDLE.—Albert A. Young, (assignor to himself and George T. Dalton,) Boston, Mass. Antedated January 16, 1868.

I claim the combination and arrangement of the body of the brush with respect to the cap, B, the handle, C, the screw, D, the groove, a and the pin, b, whereby the handle, C, may be extended at either end of the brush, the several parts being constructed and arranged with respect to each other, substantially in the manner and for the purpose set forth.

74,028.—BOILER TUBE FERRULE.—James U. Adams, Richfield, Mich.

I claim the combination of the ferrule, c, with the tube, A, and plate, a, substantially as herein described.

74,029.—MODE OF SECURING BOX METAL IN CARRIAGE HUBS.—Augustus H. Ahlborn, Lawrenceville, Pa.

I claim tinning the interior of carriage boxes prior to lining them with a metallic alloy, so that said metallic alloy will adhere to the box and become part of the same, substantially as herein described and for the purpose set forth.

74,030.—BRICK MACHINE.—John Armstrong, St. Louis, Mo.

I claim, 1st, The hopper, R", in combination with the plunger, S, for feeding the machine, when constructed and arranged to operate substantially as herein described and set forth.

2d, Providing the plungers, H I, and die box, J, with hollow chambers, so that the brick or other materials that are being moulded may be surrounded on all sides with heated surfaces, substantially as shown and described.

3d, The follower, N', in combination with the vertically moving table, N, for delivering the brick on to the discharging carrier belt, Q, when constructed and arranged to operate substantially as herein described, and set forth.

4th, Imparting to the discharging carrier belt, Q, an intermittent motion, by the means substantially as herein described.

5th, The plungers, H and I, provided with the projections, G G', and F F', in combination with the cams, d e, and the cams, a b c, for imparting to them a reciprocating longitudinal motion, when constructed and arranged to operate substantially as herein described.

6th, The shaft, O, provided with the spiral spring, o', in combination with

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the lever, p, and hook, q, when constructed and arranged to operate substantially as described.

74,031.—CULTIVATOR.—Henry B. Arnoldt and John Grimm, St. Louis, Mo.

We claim, 1st, The weed cutter, C, when combined with a cultivator, A B, as and for the purpose herein shown and described.

2d, Also, the movable arm, A1, when combined with the plow beam, A, as described, and for the purpose set forth.

3d, Also, the plow handles, A3, and the curved rack, A4, for the purposes herein set forth and described.

74,032.—CORN PLOW AND CULTIVATOR.—Isaiah B. Arthur, Sidonsburgh, Pa.

I claim, 1st, The combination of the fixed central handle, E, with the shifting adjustable handle, E', when used in a corn plow and cultivator, substantially as and for the purpose specified.

2d, Also, the wire guard, C, when constructed in the form shown, hinged at its rear end, and allowed to rise and fall at its forward end, and, when held in position by rods, c' c' at its forward end, preventing the two guards from changing their parallel position to each other substantially in the manner and for the purposes se forth.

3d, Also, the corrugated plates, e e, when used in combination with the side beams, A2 A3, having corrugated ends, substantially as and for the purposes indicated.

74,033.—LAMP LIGHTER.—Albert Assman, Rahway, N. J.

I claim the pole, A, light, B, and tube, C, when arranged as described, in combination with the wrenches or brackets, f, all made and operating substantially as and for the purpose hercin shown and described.

74,034.—GATE.—Jearum Atkins, Mokena, Ill.

I claim a gate, constructed as described, having the pivoted braces, R S, post, A, and guide bars, D G, and post, E, all arranged and operating as specified.

74,035.—COMBINED HARROW AND STONE REMOVER.—Ezra Babcock, Scott, N. Y.

I claim, 1st, The cylinder, E, provided with rows of hooked teeth, and arranged with the bed pieces, C, as and for the purpose set forth.

2d, The combination of the cylinder, E, with the body, A, said body being provided with a movable bottom and the rack, L, as and for the purpose specified.

3d, The windlass, D, when arranged with the body, A, and cylinder, E, as and for the purpose set forth.

74,036.—HARVESTER.—S. O. Bartow, Bethel, Conn.

I claim, 1st, The construction and arrangement of the pendent bar, k, pivoted arm, i, finger bar, L, pitman, A', right angular lever, M, and chain, l, all operating as described for the purpose specified.

2d, The arrangement of the gear wheel, p, upon the shaft of the wheels, B, sliding pinion, G, upon shaft, H, bearing the cam wheel, 1, lever, J, having its fulcrum in the pendent, f, upon the side of the shaft, A, pitman A' finger bar, L, pivoted arm, i, pendent bar, k, right angular lever, M, and chain, l, all operating as herein shown and described.

74,037.—RAILWAY JOINT.—Lewis Behymer, Indianapolis, Ind.

I claim the coupling, A, with re-entrant angular excavations, D, and swells F, which fit and embrace the wedge-formed ends and the hollow of the rail, the same being secured by bolts, f, which traverse said coupling, and the slots, H, in the rails, substantially as set forth.

74,038.—SEWING MACHINE.—G. W. Bell, Rising Sun, Ind.

I claim, 1st, The construction and arrangement of the eccentric wheel, F, balance wheel, G, pendulum frame, N, supporting frame, I, jointed dog, I, shaft, D, and brace or connecting bars, K and M, as herein described, for the purpose specified.

2d, The sliding bearings, S, constructed as described, fitting upon the square shaft, D, and turning freely in the box upon the upright, T, said box adjusted upon the upright by means of the sliding sleeve and set screw, as herein shown and described.

3d, The combination of one or more adjustable supports, T, with the sliding bearings, S, and shaft, D, constructed and operating substantially as herein shown and described and for the purpose specified.

74,039.—STEAM ENGINE.—E. H. Bellows, Worcester, Mass.

I claim, 1st, The arrangement of the valve rods, D D and E E, in the chamber, M, and in relation to each other, substantially as and for the purposes set forth.

2d, The combination, with the valve rods, D D, and E E, of the shaft, H, spindle, I, and cams, G and L, substantially and for the purposes set forth.

74,040.—LIFTING JACK.—James W. Bemis, Fall river, Mass.

I claim, 1st, The arrangement, as described, of the levers, L, and L L, L L, together with standard, A B, A B.

2d, Also, the combination of the levers, L, and L L, L L, together with their supporting frame, by which the power to raise the axle is obtained, substantially as described and set forth as above.

74,041.—WATCH.—B. D. Bingham, Boston, Mass.

I claim, in combination with peripheral rings of watches, spurs or projections for holding them in place, substantially as described.

Also, making such rings of a width equal to, or but slightly exceeding the space between the inner surfaces of the two main plates of a watch, and so as not to cover the larger portion of the thickness of the back plate, for the reason set forth.

74,042.—CIRCULAR SAWING MACHINE.—C. D. Blakeslee (assignor to himself and Elias Skinner), Grand Rapids, Mich.

I claim the saw-hood constructed as described, consisting of the adjustable curved guards, C, the curved hood, D, secured to the guard, C, by the bolt, d, and notch, c, and the notched vertical guard, F, adjusted upon the hood by the set-screw, f, and slotted part, E, as herein described, for the purpose specified.

74,043.—SAFETY HOOK.—E. F. Brundage, Virginia city, Nevada, assignor to himself, William T. Eaves, and William Eaves.

I claim the collar, C, fitted on the swivel stem, B, and provided with notches or recesses, i k, in its under side, in combination with the hinged part, c, of the hook, and the projection, j, on the upper part, b, thereof, all arranged substantially as and for the purpose set forth.

74,044.—CULTIVATOR.—John Burnham (assignor to himself and David L. Hough), La Salle, Ill.

I claim, 1st, In combination with the elevated axle-tree, A2, hounds, B, pivoted draft pole, and C, lever, C', having a movable fulcrum, the pivoted beam, D, having the plow beams secured to its extremities, or to pendants applied thereto, said beam being connected, by means of a chain, to the draft pole, substantially as described.

2d, In combination with a pivoted beam, D, arranged and operated as described, and provided with pendants upon its ends, the plates, d' d', having the plow beams attached to them, substantially as described.

3d, The flexible draft connection, h, secured to swinging pendants, G G, at its ends, and passed around the axle tree, A2, longitudinally, substantially as described.

4th, The removable driver's seat, H, applied to the carriage, and supported thereon, substantially as described, in combination with levers, P, suspension chains, j, beams, E, and pivoted cross beam, D, substantially as described.

5th, The attachment of the plow blades or shovels, J, to their standards, by means of loops, m, and clamping eye or hooked bolts, n', substantially as described.

74,045.—STEAM HEATING APPARATUS.—James Chambers, Boston, Mass. Antedated Jan. 31, 1868.

I claim the combination of the boiler, A, the gas burner, D, its conduit, i, and cock, g, the safety-valve, B, the lever, a, thereof, the chain, i, and the arm, h, and its weight, o, or their equivalents.

Also, the combination of the same and the coil, C, and the damper, d, and its bent arm, e, and the chain, p, connecting such arm with the safety valve lever.

Also, the combination of the circulation or induction and eduction pipes, b c, with the boiler, the gas conduit and burner, the safety-valve, the lever chain, and weighted arm, connecting the safety-valve and gas cock key, as set forth.

Also, the combination of the gas burner and its conduit with an extension, q, of the conduit beyond the burner, and with a screw cap or thimble, m', screwed upon such extension as set forth, such being to enable atmospheric air to be supplied to the gas conduit, as circumstances may require, when such gas conduit and its burner are combined with a boiler, as set forth.

74,046.—STEAM ENGINE.—William T. Chamberlain, Norwich, Conn., assignor to himself and Charles W. Chamberlain, Boston, Mass.

I claim the improved engine, as described, viz., as made with the cylinder, A, the partition, B, the two pistons, D E, the rod, C, the induction ports, e f, and eduction ports, g h, arranged in manner substantially as specified.

Also, the combination of the movable partition, B, its packing and clamp screws, or the equivalents of the latter, with the cylinder, A, provided with induction and eduction ports, and two pistons, D E, arranged so as to operate as described.

74,047.—HAND SPINNING WHEEL.—S. W. Clark (assignor to himself, N. A. Wright, and W. A. Terry), Prairie du Chien, Wis.

I claim the curved rod, r, with the adjustable weight, r', attached to the radial arm, D, the segmental groove, m, cord, m', pulley, i, and treadle, q, in combination with the spinning wheel, C, and the spindle d, placed on the upper end of the arm, D, the whole being arranged and operated substantially as and for the purpose herein described.

74,048.—BRUSH.—William W. Clark, New York city.

I claim a brush, as a new article of manufacture, when constructed as described, with an interliner, a, as and for the purpose specified.

74,049.—LAMP.—Michael Henry Collins, Chelsea, Mass.

I claim the combination of the auxiliary supporter, S, or its equivalent, with the chimney rest and the chimney-holding friction cone or air deflector arranged as described, and so connected as to be capable of being slipped together, and with the chimney, on and off the wick tube, and away from the supporter, for the purpose of enabling access to be had to the wick for trimming it, as occasion may require.

74,050.—TOBACCO PIPE.—James Cook, West Groton, Mass.

I claim the chamber, D, formed around the sides of the bowl, C, by suspending the latter in the screw cap of the bowl, A, as and for the purpose specified.

74,051.—HEATING FURNACE.—Nathaniel E. Cornwall, New York city.

I claim, 1st, The radiator, consisting of the base, a, with pipes, c c c c, and the chamber, b, or chambers, b and d, substantially as described, and for the purposes set forth.

2d, The crescent check damper and the crescent close damper, constructed substantially as described, and arranged so as to operate in the manner and for the purposes shown.

3d, The fire pot, constructed in two parts, with a self-adjusting grate in each part, and a movable partition, substantially as described, and so arranged with separate radiators in separate compartments of the hot-air chamber of a furnace, and separate systems of hot air pipes and distributing registers, as to convey all the heat from both parts of the fire pot to one system of registers, or to distribute the heat from one part of the fire pot to every system of registers, at pleasure.

74,052.—WASHING MACHINE.—E. Hall Covel (assignor to Home Manufacturing Company), New York city.

I claim, 1st, The annular bands, b and c, with or without the ears, a1 and b', so constructed and arranged as not only to hold together the upper and lower ends of the staves, but also to cover a greater or less portion of the upper and lower surfaces of such ends, substantially as herein set forth.

2d, The detachable pin or stud, a2, in combination with the tubular sleeve, g, carrying the radial fins or ribs, and the circumferential groove, f', of the standard, e, substantially as and for the purpose specified.

3d, The ogee-shaped fins, i, on the disk, h, arranged to rotate within the tub, A, substantially as and for the purpose specified.

4th, The combination of the spring-catch, k*, and spurs, k', with the pivoted bar, k, carrying the crank shaft, n', and bevelled pinions, m n, substantially as and for the purpose specified.

5th, The clutch, m'', a*, arranged to connect the sleeve, g, with the gearing upon the bar, k, substantially as herein set forth.

6th, The washing machine, constructed and operating substantially as herein shown and described.

74,053.—THREE HORSE EQUALIZER.—Giles Cramton, Marshall, Mich.

I claim the arrangement and combination of the pulley, D, coupling tongue, B, pin, F, hollow disk casing, A, and hitching chain or chains, G, with the whiffletree, E, and double-tree, F, of a three-horse team, substantially as and for the purpose herein described.

74,054.—HAY PRESS.—G. W. D. Culp, East Enterprise, Ind.

I claim, 1st, The shaft, C, when provided with a loose gear wheel, g, and with a sliding clutch, k, in combination with the capstan, G, all made and operating so that the shaft can be revolved with or without the capstan, as may be desired.

2d, The disk, d, on the shaft, C, for operating the beater, in combination with the capstan, G, and cogs, g h, and i, for operating the follower, all made as set forth.

3d, The catch, m, on the sweep, k, in combination with the arm, L, on the capstan, G, all made and operating substantially as herein shown and described.

4th, The device for automatically opening the feed door, M, by the downward motion of the beater, consisting of the elbow, P, catches, O, and weight r, all made and operating substantially as herein shown and described.

5th, The device for automatically closing the feed door by the upward motion of the beater, consisting of the lever, N, weighted cord, g, and catches, O, all made and operating substantially as herein shown and described.

74,055.—HAY LOADER.—Ezra N. Curtice, Spring Water, N. Y.

I claim the construction and arrangement of the shafts, b b, having drums, h, and hung to the pivoted pendant, a, and provided with the flanged elastic friction rollers, c c, operating against the hind wagon wheels, B, by means of the curved rods, and lever, e, as herein described for the purpose specified.

74,056.—PROCESS OF TREATING WOOD FOR COVERING WALLS, ETC.—Abbot R. Davis, Cambridge, Mass.

I claim the employment of glycerin for saturating thin sheets or laminæ of wood, to be used as a wall covering or for other purposes, substantially as described.

74,057.—LID FOR TEA-KETTLE.—Isaac De Haven, Allegheny city, Pa.

I claim a lid provided with a hinged joint, and pivoted to the body of a tea kettle or other vessel, substantially as herein described, and for the purpose set forth.

74,058.—VELOCIPEDE.—Louis Derozier (assignor to himself and George Schaffer), New York city.

I claim, 1st, Providing a velocipede with a rear axle, which consists of two sections, C C', each turning independent of the other, substantially as and for the purpose herein shown and described.

2d, Providing the bearings for the axles, C C', and F, or either, directly in the springs, B and K, substantially as and for the purpose herein shown and described.

3d, The crank axles, C C', and wheels, D, when arranged as described, in combination with the springs B, in which the bearings for the said axles are provided.

4th, The above, in combination with the front axle, F, wheels, I, and king bolt, H, having a crank, all made and operating substantially as and for the purpose herein shown and described.

74,059.—COTTON BALE TIE.—Jos. B. Dunn, Petersburg, Va.

I claim the improved bale tie, A, formed with a slot, B, at one end, and a lateral slit or open slot at the other end, said open slit or slot having a shoulder, a1, at its outer end, and having its inner side struck or bent downward, forming a curved lip, a2, substantially as herein shown and described and for the purpose set forth.

74,060.—WASHER FOR LOCK NUT.—D. Elliot and E. Seely, New York city.

We claim the washer, C, constructed as described, provided with the concentric pawl D, cut from it and adapted to fit into the ratchet teeth, f, formed in the chamber of the nut, E, to prevent the said nut from turning off the bolt, B, as herein shown and described.

74,061.—BOILER FOR HEATING WATER.—John Ellis, White Plains, N. Y.

I claim the boiler for heating water consisting of the two hollow heads connected by the tubes and having no metallic sides of walls, the gate bars being also tubular, said heads subdivided into compartments, so that the water shall circulate freely through the boiler, as herein described, for the purpose specified.

74,062.—MACHINE FOR BORING WATER HUBS.—J. W. Emerson, Rochester, Minn.

I claim the small shaft, L, in combination with the shaft, J, handle, j, gear wheel, S, circular plate, K, stop, T, gear wheels, N O, an cutter, R, substantially as described, for the purpose specified.

74,063.—MANUFACTURE OF ILLUMINATING GAS.—John J. Ensley, New York city, assignor to Thos. D. Ledyard, Toronto, Canada. Antedated Jan. 27, 1868.

I claim making a compound gas by the mixture with common coal gas, of gas made from bones, or other animal matter, and from wood, or equivalent vegetable matter, either separately or combined, for the purposes herein specified.

74,064.—HORSE HAY FORK.—Henry A. Estes (assignor to himself and George Smith), Jersey City, N. J. Antedated Jan. 31, 1868.

I claim, 1st, The toggle bars and central operating rod, in combination with the tubular stock and the two laterally moving lifting spurs, substantially as and for the purpose herein set forth.

2d, The arrangement of the guards, e, with reference to the lever, B, and the upper end of the tubular stock, A, substantially as and for the purpose herein set forth.

3d, The laterally moving spurs, E, toggle bars, D, and central rod, c, arranged in relation with the tubular stock, A, lever, B, and guard, e, substantially as and for the purpose herein set forth.

74,065.—APIARY.—William Faulkner, Vevay, Ind.

I claim, 1st, The provision in an apiary of the sunk hatchway, G, pit, A, and flue, N, together with suitable registers, or their equivalents, substantially as and for the purpose herein set forth.

2d, In combination with the elements of claim 1st, the insulating walls, K, and ceilings, L, as and for the purpose explained.

3d, An apiary supported on posts, which rest in cups, D, in connection with a pit or depression in the ground, and a hatchway, as represented.

74,066.—SOLING SHOES.—L. A. Favre, Geneva, Switzerland.

I claim the metallic plate, rigidly secured to the inner sole b, and provided with slots, f, adapted to receive and retain projections, g, on the outer sole, e, as and for the purpose set forth.

74,067.—INJECTOR FOR STEAM GENERATORS.—E. Ferguson (assignor to Isaac H. Ferguson and Mitchell, Allen & Co.), New bern, N. C.

I claim the arrangement of the supply pipe, B, cock, D, and pipe, C, with the boiler, A, whereby, with a vacuum in the boiler, and consequent atmospheric pressure, the water is injected to the boiler, substantially as herein shown and described.

74,068.—MACHINE FOR FORMING SHEET METAL MOLDINGS.—Valentine Fischer, New York city.

I claim, 1st, The machine having the rounded and square dies arranged as described, whereby all kinds of smooth moldings can be formed, as herein shown and set forth.

2d, The standard, D, when provided with one concave side, as shown.

3d, So arranging the dies, E and F, that the latter can be placed upon the former without any other fastening, as described.

4th, Arranging the female die, G, above the male die, E or F, for the purpose of keeping the female die clear, as set forth.

5th, The device for operating the movable die, said device consisting of the toggle levers, J L, in combination with the pendant bar, H, and central bar, K, so that by moving the latter horizontally the die will be moved up and down, as set forth.

6th, The manner herein shown and described of operating the bar, K, by means of the screw, N, and the nut pinion, O, all made as set forth.

7th, A machine for forming sheet-metal moldings, when the same are made and operating substantially as herein shown and described.

74,069.—TUNNEL EXCAVATOR.—Theodore A. Fisher and Anson F. Fisher, Beardstown, Ill.

We claim the sliding coffer, A, the excavating disk, D, and the supporting car, E, combined with the cast iron tubing, C, united in sections within the coffer, constructed and operating substantially as and for the purpose herein described.

74,070.—COTTON BALE TIE.—Addison C. Fletcher, New York city. Antedated Jan. 23, 1868.

I claim the plate, A, having an aperture, c e d, lateral side openings, f f', opening, g, and lip, h, for operation in connection with a rope or equivalent material, substantially as set forth.

74,071.—BOOT ATTACHMENT TO CARRIAGES.—Marvil M. Follett, Upton, Westboro Post Office, Mass.

I claim, 1st, A boot attachment to carriages composed of the rollers, C E and D, and the spring, S, and strap, a, whereby a boot for carriages is wound up by the force of a spring, S, substantially as shown and described and for the purposes set forth.

2d, The check, a2, or its equivalent, in combination with the boot, B, and spring, a1 and pin, a3, substantially as shown and described and for the purposes set forth.

74,072.—SECURING HOOKS AND EYES TO CARDS.—James D. Franklin (assignor to Ira Richards & Co.), Attleborough, Mass.

I claim hooks and eyes secured to cards by passing the eyes through the card so as to project on both sides thereof, and fastening the hooks to their ends and bodies, on one or both sides of the card, substantially as set forth.

74,073.—SEEDING MACHINE.—Olney Fry, Jr., Albany, Oregon.

I claim, 1st, The combination of the gear wheel, N, attached to the drive-wheel, A, pinion wheel, M, shaft, L, crank or crank wheel, K, connecting rod, J, and lever, I, with each other and with the seed box, E, and adjustable sliding bar, F, said seed box and sliding bar being constructed and arranged substantially in the manner herein shown and described.

2d, The combination and arrangement of the sliding bar, P, connecting rod R, and lever, S, with each other and with the shaft, L, substantially as herein shown and described, for the purpose of throwing the pinion wheel, M, into and out of gear with the gear wheel, N.

3d, The combination of the posts, T, cross bars, U, longitudinal bar, V, beam, W, plow standards, X, bar, Y, and draft bars or rods, Z, with each other and with the frame, D, and tongue, C, said parts being constructed and arranged substantially as herein shown and described and for the purpose set forth.

4th, The combination of the keeper, C', lever, A', spring, E', and notched standard, F', with each other and with the longitudinal bar, V, substantially as herein shown and described and for the purpose set forth.

74,074.—DITCHING MACHINE.—A. A. Fuselier, Algiers, La.

I claim the excavators, D, formed as described, in combination with the drums, C C', the chute, E, and the rotary cutter, F, and the board, c, all constructed, arranged, and operating as and for the purpose set forth.

74,075.—STEAM PUMP.—J. B. Gardiner, Springfield, Mass.

I claim, 1st, The arrangement of ports, g g', on each end of the valve, and communicating with the exhaust, for the purpose of assisting in the movement of the valve, substantially as set forth.

2d, The arrangement of the steam chamber, A, and exhaust chamber, J, upon the two sides of the steam chest, substantially as set forth.

3d, The arrangement of the screws, o o', wherewith to adjust the amount of steam let on and off the valve, as described.

4th, The stuffing box constructed of the followers, P P', and nut, S, in combination with the piston, A, and plunger, B, substantially as described.

5th, In combination with the central-acting valve, valve rod, C, and steam piston, arranged and operating as described, the plunger, B, of a single acting pump.

74,076.—BUTTER WORKER.—Henry Garrett, Richmond, Mo.

I claim the curved or semicircular butter pan, B, in combination with the pressure roller frame, D, provided with rollers having fluted or smooth peripheries, all arranged substantially as and for the purpose set forth.

Also the cap or hood, C, provided with the strainer, a, and placed or formed at one end of the butter pan, B, substantially as and for the purpose specified.

74,077.—WEATHER STRIP.—W. L. Gilroy, Philadelphia, Pa.

I claim, 1st, The insertion of a flat elastic strip into a molding, such as above described, in an inclined position to its surface, as herein set forth.

2d, Also affixing said elastic medium into the groove in the rigid molding by means of water-proof cement, as and for the purposes specified.

74,078.—MANUFACTURE OF CLAY PIPES.—H. A. Goodrich and Joseph Amos, Joliet, Ill.

We claim the combination of the stationary mouth piece, L, the trough, B, and carriage, G, all arranged to operate as shown and described.

74,079.—BRICK MACHINE.—Ephraim R. Green and Henry D. Phillips, Jr., Trenton, N. J.

We claim, 1st, operating the molds, R, that is to say, feeding the empty ones underneath the press boxes, C, and shoving the filled ones out from underneath the same by means of the slides, P, having weights, V, attached, and connected to the cranks, N, of the shafts, M, by means of the crank pins, j, and slotted arms, O, all arranged substantially as shown and described.

2d, The bars, U, for discharging the bricks from the molds, operated by the levers, T, and wipers, S, from the shafts, M, all arranged substantially as and for the purpose set forth.

3d, The application of a press box, C, to each side of the box, A, of the mud mill, in combination with the four shafts, H, operated from the mud mill shaft, R, and the cams, h, for operating the plungers, F, all arranged substantially as shown and described.

74,080.—FRICTION CLUTCH.—A. W. Hall, East Lebanon, N. H.

I claim the two-part clutch, E and F, substantially as and for the purpose described.

74,081.—MODE OF CONSTRUCTING MOLASSES CUPS OF SHEET METAL.—Griffin B. Halstead, New York city.

I claim a molasses cup constructed of two equal vertical parts, A A, swaged or struck up in proper form, and connected together by solder, substantially as herein shown and described.

74,082.—CULTIVATOR.—John R. Hand (assignor to himself and Johnson Orr), College Corner, Ohio.

I claim, 1st, The draft pole, M, capable of adjustment upon the beam, A by means of the clevis, O, and screw, P.

2d, Also in combination with the elements of claim 1st, the shares, G G' K K', and handles, R R', adjustable in the manner set forth.

74,083.—COMPOSITION FOR ROOFING.—David Harger, Des Moines, Iowa, assignor to himself, D. H. Young, and A. S. Vorse.

I claim a roofing composition composed of unboiled coal tar, sand, quicklime, sulphate of zinc, and flour of sulphur, all combined and used substantially as and for the purposes set forth.

74,084.—STEAM PUMP.—William Harsen, Greenpoint, N. Y.

I claim, 1st, The arrangement and combination of ram and piston with the lateral socket, H, the rocking-way shaft, I, arm, J, crank, K, and shaft, L, substantially as shown and described.

2d, The arrangement and combination of the lateral shaft, L, the eccentric, N, the oblique ports, d d and e, relatively to the axial line of the steam cylinder, and the sliding valve, O, substantially as set forth.

74,085.—HARVESTER.—Bradford G. H. Hathaway, Rock Stream, N. Y.

I claim, 1st, The planet wheels, H, when attached to the inner face of a revolving plate, F, so adjustably connected with the driving wheel that it may be caused to revolve on the axle or remain stationary, substantially as set forth.

2d, The mode of throwing the driving mechanism out of or in gear by the pawl or pawls, G, attached to the driving wheel, notched recess, G1, collar, G3, lever, G5, and rod, G6, acting either by means of the yoke, G4, or its equivalent, substantially as described.

3d, The combination of the bent axle, B, bar, O, lever, P, rod, P1, and wheel, A', for regulating the hight of the cutter bar, M, substantially in the manner set forth.

4th, The mode of suspending the rear of the detachable platform, Q, by means of the stirrup, R, attached to the adjustable bar, O, substantially as set forth.

5th, The arrangement of the bent axle, B B', driving wheel, A, and wheel, A', attached to an adjustable bar, O, substantially as described.

74,086.—DEVICE FOR PREVENTING COWS AND CALVES FROM SUCKING THE TEATS AND FOR LEADING CATTLE.—Asa S. Haven, Barre, Mass.

I claim, 1st, The frame, a, in combination with the adjustable stops or retaining pieces, b c, substantially as and for the purpose set forth.

2d, I claim the eye, g, in combination with the frame, a, substantially as and for the purpose described.

74,087.—BOLT AND RIVET CUTTER.—John S. Henry and Abraham H. Reist, Manheim Pa.

We claim the combination and arrangement of the jaws, D E, unobstructed on one side when said jaw, D, is connected with piece, C, with its fixed loop, L, and pivot connection to H, and the jaw or cutter, E, with its shoulder, e, is on the end of the prolonged handle or lever, B, combined and operating in the manner and for the purpose specified.

74,088.—CHURN.—Porter Hill, Millport, N. Y.

I claim, in combination with the dasher, B, a spiral spring, C, placed below the same, and arranged to operate substantially as and for the purpose set forth.

74,089.—WATER WHEEL.—William J. Hoffman, Croton Falls, N. Y., assignor to George V. Hoffman.

I claim the tangential buckets, A*, constructed with radial or nearly radial end portions, b, and arranged with reference to the inclined passages, c, near the periphery of the wheel, substantially as and for the purpose specified.

74,090.—STEM-WINDING WATCHES.—Edward Howard, Boston, Mass.

I claim, 1st, Applying the winding mechanism directly to the barrel which contains the spring, in the manner and for the purpose substantially as described.

2d, Also the sliding plate, i, in combination with the spur wheel, g, and button or washer, h, as and for the purpose set forth.

3d, Also, in combination with the arbor or key, l, provided with a movable double crown wheel, m, the spur wheel, g, sliding plate, i, and button, h, as specified.

4th, Also the barrel, c, constructed as described and arranged within an opening in the plate, a, in combination with the main wheel, w, spring, v, and pawl, e, substantially as and for the purpose specified.

5th, Also the spring barrel formed with the plate, c, the rim or annular projection, a', and the toothed flange, c', as and for the purpose set forth.

74,091.—FLOUR SAFE AND SIFTER.—F. A. Hoyt, Hanover, Wis.

I claim the flour sifter and safe constructed as described and consisting of the box, B, having door, i, molding board, k, drawer, g, sifter, A a, crank shaft, d S, metallic slotted straps, b, side pieces, c, wheels, m n, handle, h, and connection, e, all arranged and operating as set forth.

74,092.—CORN PLANTER.—N. G. Hughes, Waynesburg, Pa. Antedated January 27, 1868.

I claim, 1st, The combination of the tubes, G and A, with the seed box, E, and spout or tube, F, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the connecting rod, I, spring, J, crank shaft, K, connecting rod, L, and lever or trigger, M, with each other, with the interior tube, H, and plow handle, C, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the hand cover or guard, N, with the plow handle, C, substantially as herein shown and described and for the purpose set forth.

74,093.—VISE.—Thomas H. Humphreys, Trenton, N. J.

I claim, 1st, The combination of the dove-tail formed slide or sword, A, nut, E, and adjustable thimble, D, as arranged, shown and described.

2d, Also, in combination with screw, C, the adjustable thimble, D, operating as herein described.

74,094.—NAIL-PLATE FEEDER.—Cyrus D. Hunt, Fair Haven, Mass.

I claim the method of feeding the nail plate by means of the hinged rest, B, feed rest, E, feed rod, H, the springs, G g, the lever, F, the catches, f f, and the nipper rod, I, constructed and operating substantially as described.

74,095.—MACHINE FOR CUTTING CARDS.—E. J. Hunt, Concord, N. H.

I claim, 1st, The rotary cutter board, B, in combination with the gear wheels, C D, the ratchet wheel, m, and the cutter arm, E, constructed and operating substantially as and for the purpose herein described.

2d, The adjustable sections, e e, with the knives, p p, and the circular slotted plate, H, in the cutter box, F, constructed and operating substantially as and for the purpose specified.

74,096.—SAWING MACHINE.—Isaac B. Jones, Xenia, Ohio.

I claim the combination of the lever, C2, dog, F2, spring, E2, and ratchet bar, H, all constructed as described for the purpose specified.

74,097.—CHAIN SAW.—De Lancy Kennedy (assignor to Henry J. Kennedy), New York city.

I claim the manner substantially as herein described of connecting the several sections to constitute an endless chain saw, as and for the purpose described.

Also, in combination with the chain saw, the guide plate made no thicker than the saw and placed behind the back edge thereof, substantially as and for the purpose specified.

74,098.—DISTILLERIES.—Henry H. Kirk, Springfield, Tenn.

I claim, 1st, The combination of the chambers, B H, and flake-stand, F, first doubler, K, and second doubler, O, with their respective flake-stands and receiving tubs, all constructed by a series of closed pipes for the manufacture by a continuous process of treble-distilled spirits, substantially in the manner set forth.

2d, The arrangement of a pipe, R, for drawing the low wines from the

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second doubler, N, to the chamber, B, for redistillation, substantially as described.

3d, The arrangement of the pipe, S, for drawing the low wines from the first doubler, K, to the chamber, B, for redistillation, substantially as described.

4th, The coaling cylinder, Q, constructed with the diaphrams, q and q6, in combination with the revolving plates, q1 and q3, and partition, q2, substantially as and for the purpose set forth.

5th, In combination with a coaling apparatus, substantially as described, the flap valve, q5, as and for the purpose set forth.

6th, The arrangement of the resting pipes, G, substantially as described.

74,099.—GAS TORCH.—William A. Lawton, New York city.

I claim, 1st, A gas torch for all the purposes for which gas torches are used composed of the tube, A, and supply tube, D, and air tube, E, and an enlarged wick tube, F, substantially as shown and described and for the purposes set forth.

2d, The air tube, E, in combination with the tube, A, and the tube, D, substantially as shown and described and for the purposes set forth.

74,100.—SEAT CLASP OR FASTENER.—Edward C. Lewis, Auburn, N. Y.

I claim the clasp, D, levers, B and C, constructed and arranged substantially as and for the purpose set forth.

74,101,—SAP SPOUT.—R. F. Livermore, Starksboro, Vt.

I claim, as a new article of manufacture, a cast-metal sap spout constructed as described consisting of the spout, A, having the head, D, perforated at h, and provided upon its end with the concave surface in the center of which the screw, S, is secured the exterior surface of said head bevelled at a, to form the edge, a', and having upon its upper side the projection, E, as herein shown and described.

74,102.—LADDER.—T. B. Luzier and George A. Haas, Philadelphia.

We claim hooks, e e' and i, and a turn buckle, c, or its equivalent, connected to one section of a ladder and arranged for the reception and retention of the rungs of another section, substantially as and for the purpose specified.

74,103.—HORSE HAY FORK.—J. R. Lyons, Montrose, Pa.

I claim, in combination with the shank, A, and oscillating tines, B, the rod, C, and lever, D, when said rod is cut away at C1, so that when the tines are extended the point of attachment of the lever and rod shall be behind the pivot of the lever so that the weight of the load shall act to hold back the lever with a force proportioned to the weight of the load, substantially as set forth.

74,104.—CORN HARVESTER.—James Mains, Olena, Ill.

I claim the combination of the gatherers, F, and elevators, H, constructed and operated substantially as described with the frame, A, and box, K, said box being made substantially in the shape and manner herein shown and described.

74,105.—ANIMAL TRAP.—Joel Manchester, New York city

I claim, 1st, The arm or lever, E, constructed substantially in the shape and manner herein shown and described in combination with the toothed plate, H, crank lever, E, and spring, C, substantially as and for the purpose set forth.

2d, The pivoted bait hook bar or plate, I, constructed substantially as herein shown and described in combination with the crank lever, E, as and for the purpopes set forth.

74,106.—HORSE HAY FORK.—L. S. Mason, Middlefield Centre, N. Y.

I claim, 1st, The tines, E E, which project from one or more of the sides of the shank of a harpoon hay fork above the ordinary harpoons, C, and which can be drawn in and out at will, substantially as herein shown and described.

2d, A harpoon bay fork when provided with tines, E E, on the sides of its shank and with pointed side guards, F F, all made and operating substantially as herein shown and described.

74,107.—HAND TRUCK.—William May, Binghamton, N. Y.

I claim, 1st, Providing a hand truck with a hook, C, which slides on the center brace of the truck, substantially as herein shown and described.

2d, The arrangement and combination with each other on a hand truck of the hook, C, sliding on the center brace, and of the hooks, D D, fixed to the lower part of the truck, substantially as herein shown and described all made and operating as set forth.

3d, The hinged plate or bar, E, in combination with the hooks, D D, substantially as herein shown and described.

74,108.—RAILWAY SWITCH.—Jacob C. McCarty (assignor to William E. Porter), Grafton, W. Va.

I claim. 1st, The binged chair, D, when constructed in the manner and used for the purpose specified.

2d, The combination of the movable rails, A A1 B B', with the fixed rail, A2, connecting rods, R R', pitmen, P P', balance beam, T, chains, S, or their equivalents, and shaft, W, or its equivalent, substantially as and for the purpose specified.

74,109.—EYE GLASS.—John K. McDonald, Newark, N. J.

I claim the nose piece below the extensions, B, when formed of soft rubber tubing upon the spring wire fitted in notches in the rims, as herein shown and described.

74,110.—PAVEMENT.—H. G. McGonegal, New York city.

I claim the blocks, A A, when provided with perforations, C C, into or through the same, substantially as and for the purpose herein shown and described.

74,111.—SNAP HOOK.—John McKibben, Lima, Ohio.

I claim, 1st, The snap hook, constructed as described, having the spring, B, reversed in position, with its outer end riveted within the bow of the hook, A, and its free end passing back within the jaws, C, underneath the lip, D, of the pivoted jaws, C, as herein set forth for the purpose specified.

2d, In combination with the above, the rein loop, F, having formed upon it at right angles the loop, C, for the gag-runner, substantially as herein shown and described.

74,112.—CORN PLANTER.—Wm. McLucas, Reinersville, O.

I claim, 1st, The combination of a lever, B, with its valves, b and b1, operated by a wheel, E, with seed hopper, A and D, all substantially as described,

2d, In combination with the foregoing, the plowshares, G G, and harrow roller, g, substantially as and for the purpose specified,

74,113.—TREATING JUTE FIBER.—James Monarch, Philadelphia, Pa., assignor to himself, Jeffrey Hart and Robert Thorp, Conshohocken, Pa.

I claim jute fiber treated with caustic alkali of the strength of about 60°, substantially as described and for the purpose set forth.

74,114.—MANNER OF WORKING CHURNS.—James H. Monce, Hopkinsville, Ohio.

I claim the arrangement and combination of the regulating and adjustable arm, n, and dasher, adjustable lever, o, when connected with and operated by the verge, b, as herein described and for the purposes set forth.

74,115.—HAND SPINNING MACHINE.—F. D. Moore, Edray, W. Va.

I claim, 1st, The combination of the pulleys, g g', the rod, n, the slide, m, with the uprights, m2, the lever, l, and the treadle, E, arranged and operating substantially as and for the purposes herein described.

2d, The slide bar, v4, operated by the lever, l, in combination with the slotted swing bar, z, and the spring hook, v2, arranged and operating as and for the purposes set forth.

3d, The ratchet wheel, u3, and spring dog, w2, combined with the pulley, g', and operating substantially as and for the purposes herein described.

4th, The combination of the horizontal sliding bar, v4, the slotted swing bar, z, the vertical slide, v3, and the check pulley, x, arranged and operating substantially as and for the purposes herein described.

5th, The square-toothed ratchet wheel, u, the dog, u1, the slide bar, v, the dog, w1, the slidebar, v1, the spring hook, v2, and the slidebar, v4, combined and operating substantially as and for the purposes set forth.

6th, The check pulley, x, the slide, v3, the spring, a, and the slotted bar, z, or its equivalent, combined and operated as and for the purpose specified.

74,116.—LUBRICATOR FOR LOOSE PULLEY.—Geo. M. Morris and John McCreary, Cohoes, N. Y.

We claim the bushing, B, within the hub of the loose pulley, constructed as described, having the chamber, a, around its periphery, communicating with the shaft by means of the opening, e, the ends, b, of said bushing fitting snugly within the hub, and provided with the eccentric grooves, c, communicating with the shaft and chamber, r, by means of the opening, d, whereby a constant circulation of lubricating matter is obtained within and around the bushing, as herein shown and described.

74,117.—CARRIAGE WHEEL.—W. F. Morton, New Haven, Ct.

I claim the hub, cast in one piece with the collars, A A, and connecting bars, a a, when constructed in the shape and proportions as described.

74,118.—OINTMENT.—Lycurgus H. Moseley, Franklin, Tenn.

I claim the ointment, compounded substantially as and for the purpose above described.

74,119.—BREECH LOADING FIREARMS.—Florent Muller, Hartford, Ct.

I claim the combination with the hinged breech-block, E, of the locking slide, G, and lever, J, applied and operating substantially as and for the purpose set forth.

74,120.—PORTABLE HAY AND GRAIN ROOF.—John J. Naylon, Brighton, Mich.

I claim the ropes, G, posts, D, shafts, H, and cranks, J, when used in connection with the roof, A, substantially as herein shown and described, and for the purpose set forth.

74,121.—SELF-SEALING PAMPHLET COVER.—Wm. H. Nichols, East Hampton, Ct.

I claim a self-sealing catalogue, pamphlet, magazine, etc., substantially in the manner and for the purpose set forth.

74,122.—BRIDLE BIT.—John K. Norton, Flushing, Ohio.

I claim the combination of the bar, A, with the ring, D, and branch, E, and the bar, B, with the ring, F, and branch, G, when constructed as herein described and for the purpose set forth.

74,123.—CULINARY VESSELS.—James Willard Patterson (assignor to Sarah Ellen Patterson), Cincinnati, Ohio.

I claim 1st, The suspending of a series of cooking vessels, having imperforated bottoms and sides, and provided with close covers, in an upright column or series, in such a manner as to form steam chambers above, below and around each, as and for the purposes substantially set forth.

2d, The steam or water coil, K, provided with shield, P, and cap, S, when used in connection with the boiler, E, in the manner and for the purposes set forth.

3d, In each of a series of cooking vessels, arranged substantially as shown, and used in connection with the boiler, the chamber formed between the close sides of the inner and outer cylinder.

4th, The combination of the series of cooking vessels, N M, etc., with the boiler, E, the whole made substantially as described, and so as to operate in the manner set forth.

74,124.—PICKER-STAFF CHECK FOR LOOM.—Ezekiel Phillips and Henry C. Phillips, Blackstone, Mass., assignors to themselves and Daniel B. Pond.

We claim the friction apparatus, substantially as described, that is, as composed of the levers, B B, the friction cylinder and its bearing and cap, and the connection of such cylinder and levers, as specified.

Also, the combination of the friction apparatus, substantially as described, or its equivalent, with the lay and its pickers, or picker staves, the whole being arranged and so as to operate as and for the purpose as explained.

74,125.—BOLT FEEDER AND COOLER.—Wm. Pickens, Chicago, Ill.

I claim spindle, G, with saucer, F, breakers, H H, and fans, K K, secured to it, and constructed as described, in combination with conveying case, N, and ventilating case, I, both constructed as described, the whole arranged and operating substantially as and in the manner herein set forth, and for the purpose specified.

74,126.—PATTERN FOR DRAFTING SLEIGH BODIES.—Dennis Pierce, Waverley, Iowa.

I claim a pattern board, A, with elevation, B, constructed and adapted for laying off work for sleighs, substantially as described.

74,127.—STATION INDICATOR.—Anthony Pirz and Manuel Pirz, New York city.

We claim 1st, The application of a clock mechanism, with a spring or weights as a motor, applied to the belt of a street or station indicator for railroad cars, in such a manner as to move the belt when the same is liberated, substantially as shown and described.

2d, The adjustable plate, J, with the gearing, K L, in combination with the gearing, E D, and the drums, C C', all arranged substantially as shown and described, for the purpose of reversing the movement of the belt, F, when necessary, as set forth.

3d, The rod, P, with the notched disk, O, in combination with the belt, F, gearing, M M, and the drums, C C', G G', all arranged to operate substantially as and for the purposes herein shown and described.

4th, The brake arms, Q Q, attached to the slide rod, P, and arranged in such relation with the drums, C C', to operate in the manner substantially as and for the purpose set forth.

74,128.—FLOOR CLAMP.—Warren Portlock, Pleasant Grove, and John H. Smith, Toolesborough, Iowa.

We claim 1st, The back brace, C, provided with a knee or stub joint, constructed substantially in the manner and for the purpose as set forth.

2d, The small levers, D D, constructed and operating together substantially in the manner as above shown and specified.

74,129.—SKATE.—John W. Post, Castile, N. Y.

I claim, 1st, Adjusting the clamps, G, by means of the serrated bar, F, provided with a slot, i, in combination with the serrated forwardend of the bar, E, both held in position by a screw, h, substantially as described.

2d, The device for fastening the skate to the boot, consisting of the L-shaped spring lever, e, riveted to bar, E, with serrated and slotted rear end, and ridges, l, fitting into slots, m, on the clamps, G, substantially as described.

74,130.—CARRIAGE BRACE.—Moses Powe, Belvidere. N. J.

I claim the sheath, E, covering three sides of the joint of a brace for vehicle hoods or tops, attached to one of the braces, all substantially as shown and described, and for the purposes specified.

74,131.—DUMPING WAGON.—Joram Priest, Detroit, Mich.

I claim 1st, Having the box, J, upon the longitudinal bars, E, by a proper fulcrum between the front and hind wheels, so that the box will tilt or dump between the hind wheels.

2d, The crank-axle, F, when operating for the purposes herein described.

3d, The semi-rotating bar, I, and bearings, H, when constructed and operating substantially as and for the purposes set forth.

4th, The combination of the above parts with the axle, A, the wheels, B and G, the circle, C, the bolster, D, the wagon box, J, the transverse bar, K, the rings, L, and the catch, M, or their equivalents, when constructed and operating as and for the purposes herein set forth.

74,132.—GAS MACHINE.—Iva Prichard, Terre Haute, Ind., assignor to himself and Joseph Raiber, Baltimore, Md.

I claim 1st, The combination of the air chamber, a1, and water chamber, a with the carburetting vessel, B, and the receiving vessel, C, in the manner and for the purpose set forth.

2d, The application of a column of water to a carburetting machine, for the purpose of condensing air and forcing it through the carburetting fluid, substantially as shown and described.

74,133.—CONNECTING PUMP RODS.—H. F. Purmort, Saginaw City, Mich. Antedated Jan. 29, 1868.

I claim jointing the sections of a pump or other rod together by means of the joint, constructed and applied substantially as and for the purpose described.

74,134.—SELF LUBRICATING AXLE FOR CARRIAGES.—Silas S. Putman, Dorchester, Mass.

I claim a chamber, b, within the end of the axle, packed with fibrous or porous material, for receiving and retaining a supply of lubricating substance, which passes through openings to the bearing surface of the axle, substantially as described.

Also, providing the collar, H, with a chamber, e, for containing packing saturated with lubricating substance, substantially as and for the purpose set forth.

74,135.—CURTAIN FIXTURE.—S. S. Putnam, Dorchester, Mass.

I claim the wooden roll, D, having a chamber formed within its end, in combination with the device placed therein for raising the curtain, substantially as set forth.

Also, in combination with the above, a spring or brake, l, operating substantially as set forth.

Also, the bracket, C, with its lip or projection, l, in combination with the flattened end, 5, of the spindle, substantially as and for the purpose described.

74,136.—HORSE RAKE.—Oliver E. Randall, Lewiston, Me.

I claim 1st, The springs, L, applied to the tooth bars, G, and to the bar, K, substantially in the manner as and for the purpose set forth.

2d, The bar, I, placed underneath the tooth bars, G, and connected to the oblique bars, J J, which are secured to the rod or shaft, F, when said bar, I, has the perforated bar, K, connected to it for the upper ends of the springs, L, to pass through, substantially in the manner as and for the purpose set forth.

74,137.—WOVEN FABRIC.—E. F. Richman, Muscatine, Iowa. Antedated Aug. 5, 1867.

I claim 1st. The method herein described of weaving fabrics having two or more thicknesses of separately interlocked weft-threads, whereby the upper or lower surfaces are made substantially alike, and so that the fabric presents no right or wrong sides, substantially as above shown.

2d. A woven fabric, substantially as described, consisting of two or more layers of separately interlocked weft threads, the threads of one layer of weft always lying opposite the spaces between the weft threads of the layer above or below it, and with all the warp threads passing from surface to surface, and binding the whole together, as above shown.

74,138.—CULTIVATOR.—John C. Rickerd, Lewisville, Ind.

I claim, 1st, The double hinge, consisting of the screw bolt, f, bases, g, flanges, h k l, lips, l j, and pins, m, to hinge the cultivator beams to the main frame, all constructed and arranged substantially as described.

2d, The hinged seat, l, supported by means of curved rods, and provided with foot rests, p, substantially as and for the purposes set forth.

3d, The combination of the frame, A, hooks, n, rods, a2, and foot rests, p, substantially as and for the purposes set forth.

74,139.—HOLTZ ELECTRICAL MACHINE.—Edward S. Ritchie, Brookline, Mass.

I claim the combination and arrangement of the supporting plate, C, of glass or other equivalent material, with the several sectors, and the combs arranged together and with the rotary electrizing disk, substantially as specified.

Also, the application of the plate, C, not only to the several sectors and combs, for giving support to them in their proper relations with one another and the rotary disk, but as a support for one of the bearings of the shaft of the rotary disk, the whole being substantially as hereinbefore explained.

74,140.—ENVELOPE MACHINE.—Abram A. Rheutan, Worcester, Mass.

I claim, 1st, The rotary table, B, having one or more receptacles for blanks, substantially as and for the purposes set forth.

2d, The lever, F, arranged for operation substantially as and for the purposes set forth.

3d, The use and employment, in an envelope machine, of a weight separator, for preventing the lifting of more than one blank at a time, substantially as set forth.

4th, The combination, with the base of the folding flaps, of central bearings, substantially as and for the purposes set forth.

5th, The combination, with the folding flaps, I J K and L, of the bearing pieces, 7 8 9 and 10, substantially as and for the purposes set forth.

6th, The combination and arrangement, with the standards, 3 3, of the projections, 4 4, for the purposes stated.

7th, Making the beaded portions, 14, of the folding flaps eccentric, substantially as and for the purposes set forth.

8th, The combination, with the flap, I, of an adjustable or spring face, substantially as and for the purposes set forth.

9th, The combination, with one or more of the bearing pieces, of adjusting screws, 16, for the purposes set forth.

74,141.—PEAT CRIB.—Marvin S. Roberts, Racine, Wis.

I claim the portable peat crib, constructed of light scantling and boards, substantially as and in the manner herein described, and combined with blocks, P P, and wedge-board or boards, F, constructed and operating substantially as herein shown and described, and for the purposes set forth.

74,142.—APPARATUS FOR OPERATING HORSE HAY FORKS.—George M. Robinson, New Wilmington, Pa.

I claim, 1st, The carriage, D, upon the inclined bar, C, having the pivoted catch, l, upon the lower side of which the projection, i, is formed, and also provided with the cam lever, J, in combination with the bars, E F f', pulley, d2, and ball, K, as herein described, for the purpose specified.

2d, The combination of the ball, K, and hoisting rope, G, with the catch, I, having projections, i, the cam lever, J, the pulley, d2, and carriage, D, as herein shown and described.

3d, The carriage, D, operated by the single hoisting and fork rope, when the loaded fork reaches its highest elevation in relation to the carriage, before the latter is permitted to move upon the inclined bar, and when the act of raising the loaded fork disengages the catches of the carriage from their fastenings, as herein shown and described.

74,143.—HOLD-BACK HOOK.—N. W. Robinson, Moriah, N. Y.

I claim the post, F, in combination with the hook, B, substantially as and for the purpose described.

74,144.—GLOBE STEAM VALVE.—E. A. Rock, Ludlow, Vt.

I claim, 1st, The combination of the wedge, m, shell, A, and valve, G, substantially as herein shown and described.

2d, The combination of the ring, G, and the wedge, m, substantially as herein set forth.

74,145.—SPOUT BRACKET.—Jeremiah E. Rohrer, Rohrersville, Md.

I claim the spout-supporting bracket, A, constructed as represented, in combination with the clasp, C, substantially as described for the purpose specified.

74,146.—STEAM GENERATOR.—John B. Root, N. Y. city.

I claim, 1st, In combination with the water tubes, A A, the return pipes or bends, C C, arranged to connect each tube with one above and below it, substantially as specified.

2d, The bend, c, for establishing the connection with the water tubes, by free or socket joints, when furnished with packing, and held to their places by independent outside clamps, stud bolts, and nuts, or their equivalents, essentially as shown and for the purpose described.

3d, The cross-pipes, E E' and F F', or either of them, connected with the tubes, A A, at their ends, by means of independent pipes or bends, C1 or C2 essentially as shown and described.

74,147.—MEDICAL COMPOUND.—Thomas Rosbrugh, Bellefontaine, Ohio.

I claim the medicine prepared from the root of the cohush or blueberry substantially in the manner herein specified.

74,148.—CONTINUOUS LEATHER-PEG STRIP.—Charles Rowland (assignor to himself and Joseph G. Rowland), Quincy, Ill.

I claim the leather strip for pegs, prepared substantially as described, as a new article of manufacture.

74,149.—DRYING AND VENTILATING APPARATUS.—Jarvis Royal, Rochelle, Ill.

I claim the tubes, A, arranged within a bin or other place in which grain or other substance is to be dried, when such tubes are composed of earthen or other equivalent porous material that will absorb the moisture from the substance being dried, as herein set forth for the purpose specified.

74,150.—ADJUSTABLE HEAD FOR BARRELS AND FIRKINS.—Henry D. Rumsey, Homer, N. Y.

I claim the application of the flange to adjustable covers, and the slot to the inside of barrels, casks, or firkins, for the purpose of the more readily opening and closing the same effectually without starting or unhooping them, as herein set forth and described.

74,151.—EYE MEDICINE.—Hugh M. Sanderson, Noble, Ill.

I claim the medicines or compositions numbered 1, 2, 3, and 4, composed of the ingredients and in the proportions substantially as herein described and specified.

74,152.—REVOLVING CANNON.—August Schausten, Michigan City, Ind.

I claim, 1st, A cannon consisting of the barrel, A, having the annular block or ring, B, with the chambers, C, formed therein, arranged to rotate through an opening in the barrel as described.

2d, The combination of the lever, l, locking bolt, E, firing pin, o, and handle, h, arranged to operate substantially as set forth.

74,153.—SPRING-BED BOTTOM.—David A. Scott and J. E. Burdge, Cincinnati, Ohio.

We claim the prolongation, in the arms, E, in the same direction as the arms, b, of the helicoidal spring or coils, a, when constructed and secured to the cross-rail, A, substantially as herein described, as and for the purpose specified.

74,154.—APPARATUS FOR PLAYING PARLOR BASE BALL.—Francis C. Sebring, Hoboken, N. J. Antedated Jan. 23, 1868.

I claim, 1st, The partially revolving bat, E, arranged as represented, moving close to the upper surface of the board, A, and operated at the will of the player, so as to allow the striking of the ball in the several different positions, and with the several different effects, according to the skill of the player, substantially as herein set forth.

2d, Also, the spring, G, in combination with the partially revolving bat E, upon a parlor base ball board, and adapted to move the bat as the operating cord, H, is released, substantially as herein set forth.

3d, Also, the automatic pitcher, B, mounted on a parlor base ball board, and adapted to project the ball at several angles approximating to the right direction, at the will and according to the skill of the player, substantially as herein specified.

4th, Also, the descending motion, in combination with the forward motion of the pitcher, by which the pitching device is carried so low, at the termination of its motion, as to be out of the way of the returning ball.

5th, Also, the semi-rims, I', arranged relatively to the cavities, I, or the corresponding marked spaces in which the ball is to be stopped in passing substantially as and for the purpose herein set forth.

6th, Also, the swiveling-case, L, and its attachments, mounted on a parlor base ball board, and adapted to operate relatively thereto, substantially as herein specified.

74,155.—FOLDING METAL SHUTTERS.—Samuel J. Seely, New York, assignor to J. M. Brown, Brooklyn, N. Y.

I claim forming sheet-metal shutters of leaves, bent in a curved form, transversely, and united substantially as and for the purpose set forth.

74,156.—SOCKET WRENCH.—Jas. M. Seymour, Newark, N. J.

I claim the handle, A, with its broad bottom, made substantially as shown.

Also, the shifting socket wrench, as a new article of manufacture.

74,157.—FLOUR SCOOP AND SIFTER.—George W. Sherman and Charles L. Sherman, Seymour, Conn.

We claim the combination of the scoop, A, having beads, a, handle, C, saddle, D, standard, E, crank shaft, F, arms, G G', paddles, H, sifter, B, and lip, L, substantially as described for the purpose specified.

74,158.—TRUSS.—Jacob A. Sherman, New York city. Antedated Jan 24, 1868.

I claim the curved spring, d, carrying the hernial pad, in combination with the bar, a, and spring, f, substantially as and for the purposes set forth.

Also, the sliding finger, h, fitted and acting substantially as specified.

74,159.—MACHINE FOR EMBOSSING WINDOW SHADES.—R. K. Slaughter and J. O. Hundt, New York city.

We claim, 1st, The carriage, G, when provided with an elastic cover, g, which acts as a counter-die for embossing window shades, placed upon the carriage substantially as and for the purpose herein shown and described.

2d, Providing the carriage, G, with adjustable bars, h h, which serve to hold the shade smoothly upon the carriage, and to guide the embossing rollers, F F, substantially as herein shown and described.

3d, Thenut, C, when arranged adjustable on the bar, B, in which it is held, substantially as set forth, so that the screw, D, may be moved laterally, as and for the purpose herein shown and described.

4th, The frame, e f, when arranged between the uprights of the press, substantially as described, so as to steady the printing-die or roller in every position, and during up-and-down as well as lateral motion of the same, substantially as set forth.

5th, The press, consisting of an adjustable screw and die-frame, in combination with the movable carriage, G, having an elastic cover, and adjustable guide bars, h, all made and operating substantially as and for the purpose herein shown and described.

74,160.—CABPET HOLDER.—F. Smith, M. D., Alexandersville, Ohio.

I claim a carpet holder, composed of a washer, C, and eccentric plate, A, said plate, A, rotating in a chamber in a washer, C, secured to any mop board, substantially as shown and described, and for the purposes set forth.

74,161.—GRINDING MILL.—John Snyder, Hart's Mills, Ind.

I claim the combination and arrangement of the drive-bar, K, ball or globe, M, and supporting bar, N, with each other, with the upper end of the spindle, E, and with the upper stone or runner, L, substantially as herein shown and described, and for the purpose set forth.

74,162.—BED BOTTOM.—S. L. Southard, Rock Island, Ill.

I claim the springs, C C, constructed as described, consisting of the wires coiled into spirals, e e, at their ends, said spirals fitting upon loops secured to the slats, b c, the centers of said wires bent to form loops or yokes, connected by the tube, m, all arranged as described for the purpose specified.

74,163.—PORTABLE PISTOL GALLERY.—F. A. Spofford and M. G. Raffington, Columbus, Ohio.

We claim, 1st, Providing the platform, A, with two flexible folding shields C C, on both ends, substantially as and for the purpose herein shown and described.

2d, The platform, A, when provided with a flexible folding shield, C, on each end, in combination with the perforated target, D, all made and operating substantially as and for the purpose herein shown and described.

74,164.—ADJUSTABLE BALL HOLDER FOR GAMES.—F. A. Spofford and M. G. Raffington, Columbus, Ohio.

We claim the revolving platform, A, when provided with a ledge, b, and bow, c, in combination with the bar, D, brace, d, and standard, B C, all made and operating substantially as and for the purposes herein shown and described.

74,165.—MACHINE FOR EXTERMINATING THE COTTON WORM, etc.—Chas. Steinmann, Napoleonville, La.

I claim the portable steam generator or boiler, F, or its equivalent, in combination with the pipes, M and K, when these pipes are provided with the jets or nipples, a, and are otherwise constructed as herein described, and the former is used as a steam and the latter as an oil distributer, the whole being arranged substantially as and for the purpose set forth.

74,166.—PORTABLE FENCE.—H. A. Stewart, Minneapolis, Minn.

I claim, 1st, The combination of the supports, B, constructed as described with the sections of fence, as and for the purpose herein set forth.

2d, In combination with the pivoted supports, B, constructed as described, the section of the fence, consisting of the pickets, D, upon the tarred ropes, C, as herein shown and described.

74,167.—BOX OPENER.—P. Stone, Charlestown, assignor to Joseph Yeazie and Augustus L. Dole, Boston, Mass.

I claim a box-opener, substantially as described, viz: as constructed with a claw at one end of its stock or shank, and a hammer-head at the other end thereof, and with a ram to slide on the shank or stock, in manner and against a shoulder thereof so as to operate the claw, as specified.

74,168.—LIFE-PRESERVING APPARATUS.—J. B. Stoner, New York city, assignor to himself, L. Mendelson, and T. Crommelin.

I claim, 1st, The chin protector, C, constructed and applied as herein shown and described.

2d, The combination of the open elastic band, D, formed of two elastic tubes connected longitudinally by an elastic membrane, the outer elastic tube, B, auxiliary band, E, and the upper part of the suit, A, as herein described, for the purpose specified.

74,169.—BALLASTING VESSELS.—J. B. Stoner (assignor to himself, L. Mendelson, and T. Crommelin), New York city.

I claim the temporary ballast, when consisting of the weight, F, secured to the lower ends of the rods, I I, and adapted to fit into the metallic socket, G, in the keel of the vessel, and operated from the deck, the rods, I I, working in the vertical tube, S, of the socket, G, as herein set forth for the purpose specified.

74,170.—CALCULATING AND REGISTERING MACHINE.—T. T. Strode, Morristville, Pa.

I claim, 1st, The combination of disks, A B C D E and F, or their respective equivalents, numbered and arranged as herein set forth and described.

2d, The spur, b', in combination with the pinion, G, and toothed disk, D, or their respective equivalents, substantially as shown and described.

74,171.—BROADCAST SEEDING MACHINE.—Samuel Thomson, Osceola, Wis.

I claim the rotating seed-discharging cylinder, F, in combination with the seed box or hopper, E, having an opening, a, at its lower part, the bottom plate, b, and the scattering board, G, all arranged to operate substantially as and for the purpose herein set forth.

74,172.—ROTARY STEAM ENGINE.—C. B. Turner, Grand Rapids, Mich.

I claim the piston, B, provided with the partitions, J, and chambers, i and arranged to operate in connection with the induction port, g, and valves, D, and D', as herein described and represented.

74,173.—APPARATUS FOR RAISING HEAVY WEIGHTS.—S. E. Tuttle, Genoa, Nevada.

I claim 1st, An improved machine formed by the combination of the shaft

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B, the wheel, E, having a spiral groove, e1. formed in its face, the blocks, H, having friction wheels, I, attached to them, and the slide, F, or equivalent, with each other, and with the guides, G. and frame, A, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the flanges, J and h', with the guide, G, and blocks, H, substantially as herein shown and described and for the purpose set forth.

74,174.—VINEGAR STILL.—R. L. Vance, St. Louis, Mo.

I claim, 1st, The tank, A, when divided into two cells, a a1, and combined with the distilling apparatus, e E E', as described and for the purpose set forth.

74,175.—MODE OF PREPARING AERATED LIQUIDS.—P. H. Vander Weyde, M.D., Philadelphia, Pa.—Antedated Jan. 27, 1868.

I claim, 1st, The described manner of dissolving the carbonic acid gas in the water by means of coil, gas jet, and reservoir, with stop cocks, regulator, and safety valve, this solution being made at the place and time it is to be used as beverage.

2d, Mixing carbonic acid water with the required quantities of concentrated solutions of the salts contained in diverse mineral waters, or the concentrated alcoholic extracts of beer, cider, wine, etc., and thus by only supplying one single fountain with so-called soda water, or even with pure water, to draw from it, at will, any desired mineral water, beer, champagne, cider, or wine, and, in general, any beverage containing carbonic acid, always fresh and cool, and equally effervescent.

74,176.—WALKING VEHICLE.—R. C. Vernol, New York city.

I claim the legs, C D, of a walking vehicle, when they are connected with the eccentric shafts, E E, and with the crank shaft, B, in such a manner as to receive up and down as well as oscillating motion, substantially as and for the purpose herein shown and described.

74,177.—STEP AND EXTENSION LADDER.—George S. Walker, Erie, Pa.

I claim, 1st, In a combined extension and step ladder, the hooks, i, and arm n, in combination with ladders, A B, cord, b, pulley, m, and crank shaft, a d, all constructed, arranged, and operating substantially as described and for the purpose specified.

2d, In combination with the above, the hook, h, and guides, e, substantially as described.

3d, The combined extension and step ladder, constructed substantially as described, and consisting of the sections, A B, hooks, i, arm, n, guides, e, pulley, m, cord, b, and crank shaft, a d, all arranged and operating substantially as set forth.

74,178.—METALLIC SCROLL ENDS FOR SPRING BARS FOR CARRIAGES.—A. L. Warburtou and H. Bendir, Fort Wayne, Ind.

We claim the metallic scroll ends for spring bars and head blocks for carriages, etc., as an article of manufacture, the same being constructed and used in the manner and for the purpose substantially as specified.

74,179.—PEN HOLDER.—C. M. H. Warren, Brooklyn, N. Y.

I claim a pen holder provided with a sliding handle, A, and barrel, B, and with a sliding nosing, C, all combined and arranged substantially as and for the purpose herein set forth.

74,180.—LAST.—G. M. Wells, London, Eng'd, assignor to M. D. Wells, Chicago, Ill.

I claim the last as made with the horn, F, to project from its instep part, B, and be connected therewith as specified.

74,181.—LAST.—G. M. Wells, London, Eng'd, assignor to M. D. Wells, Chicago, Ill.

I claim the last, as made, with its two sections or parts connected by dove tails, and having a slot, opening, or hole made and arranged in each, as explained, for reception of a leg or standard, as described.

Also, the combination of the key or standard with the two last sections connected by dovetails and having slots, or keyholes, or passages arranged in them, as set forth.

74,182.—BENCH HOOK FOR CARPENTERS' BENCHES.—C. H. Weston, Lowell, Mass.

I claim the bolt, H, with its cam-projection, when used with the slotted case, G, for clamping bar, D, the several parts being constructed and operating substantially as specified.

74,183.—PLOW.—Charles White, Bladensburg, Md.

I claim, 1st, The angle iron, I, in combination with the slotted transverse bar, J, and the rear end of the plow beam, for effecting the double adjustment of the latter, in the manner described.

2d, The pivotal support, G, of the plow beam, E, in combination with the perforated horizontal flange or lug, a, on the mold board, as described.

3d, The plow beam, provided with tubular or semi-cylindrical ribs or corrugations, substantially as described.

4th, The yielding tension or draft rod, passing centrally through, or having an equivalent arrangement relative to, the beam, as described.

5th, The yielding draft rod, in combination with the spring, operating as described.

6th, The drum or socket, formed in or attached to the beam, in combination with the spring and draft rod, as described.

74,184.—SUSTAINING DEVICE FOR DRAFT POLES FOR CARRIAGES.—Samuel B. Whitney, Coxsackie, N. Y.

I claim the loop or hook, i, hanging from the bolt, e, and sustaining the spring, F, in combination with the tongue, d, and jaws, c, as and for the purposes set forth.

74,185.—SKATE FASTENING.—Alfred Woodham, N. Y. City.

I claim, 1st, The heel clamps to the skates when constructed as described, to grasp the heel both upon its sides and edge, under the shank, as herein shown and described.

2d, In combination with the above, the pivoted slotted clamps, C, when provided upon their inner ends with the swivelled right angular nuts, I, receiving the screw bolt, H, whereby the said clamps are permitted to adjust themselves to the sole of the boot or shoe, by combined lateral and longitudinal movements, as herein shown and described.

74,186.—WATER ELEVATOR.—C. F. Woodruff, Newbern, Tenn.

I claim the shaft, b, working in the axle, B, having the bar, D, at its extremity, working through the slot. b", clutching the drum, C, by the stops, d, in manner substantially as above set forth and described.

74,187.—CHERRY STONER.—Rufus Wright, Brooklyn, N. Y.

I claim, 1st, The reciprocating rod, H, armed with the needles, c, provided with notches or barbs, in connection with the bed, Q, having the recess or cavity, g, made in it, and the hole, f, extending entirely through it, with the arm, S, working underneath the hole, f, in the bed, all arranged substantially as and for the purpose set forth.

2d, The vibrating bar, U, provided with the plates, u u, in combination with the reciprocating rod, H, armed with the needles, c, and the bed, Q, provided with the hole, f, all arranged substantially in manner as and for the purpose specified.

3d, The vibrating bottom, L, in connection with the tube, K, the former being provided with the curved projection, N, and arranged to operate in connection with the bed, Q, and guard, R, all arranged to operate substantially as and for the purpose set forth.

4th, The cam, G, provided with the rim, e, and pin, j, and connected with or arranged to operate the rod, H, bottom, L, strike or arm, S, and the bar, U, for the purpose specified.

74,188.—MODE OF COMPOUNDING PRINTERS' INK FROM GRAHAMITE.—Henry Wurtz, New York city.

I claim the use, as an ingredient in printing inks, of the resinous constituent of the Grahamite of West Virginia, called by me viscosine.

74,189.—CARRIAGE SHAFT AND POLE COUPLING.—Edmund A. Harvey, Wilmington, Del.

I claim, 1st, The clevis, A, with pin or bolt, C, with or without either permanent or detachable safety lips, G, in combination with hook box, B, substantially as described.

2d, The hook box, B, in combination with key bolt, D, with spring or elastic washer, E, for the purposes named.

REISSUES.

2,849.—METHOD OF CASTING SCREWS.—William Allen Ingalls, Chicago, Ill. Patented May 15, 1866.

I claim, 1st, The mode herein described for casting seamless screws.

2d, The screw herein described, as a new and improved article of manufacture.

2,850.—HORSE HAY FORK.—Mary Jane Laird, Middletown, Pa., administratrix of the estate of Andrew J. Laird, deceased. Patented August 21, 1866.

I claim, 1st, The tines, D D, having cutting edges, in combination with rod, C, substantially as and for the purpose specified.

2d, Also, the tines, D D, in combination with the rod, C, when the former are pivoted to the parallel bars, A A, and work in slots arranged in the end of the same, substantially as described, and for the purpose specified.

3d, Also, the rod, C, link, E, and lever, F, when the same are arranged and combined, substantially as described.

4th, The bars, A A, when they are connected and arranged as shown in combination with the rod, C, and link, E, substantially as described.

5th, In combination with the sliding rod, C, the lever, F, having its upper horizontal arm adapted to project through the ring, H, substantially as described, and for the purpose specified.

2,851.—INSTRUMENT FOR OPENING SEALED AND OTHER CANS. E. H. Bourne, E. Damon, Jr., and H. M. Knowles, Cleveland, Ohio, assignees of Samuel D. Lecompte, Leavenworth City, Kansas. Patented Sept. 19, 1865.

We claim, 1st, A can opener constructed of a cutter or knife connected to a handle or holder having a point so arranged in relation to said holder as to form an axial pivot for the cutter in opening cans.

2d, The point, when so arranged in relation to the holder and cutter that it acts as a point in perforating the can and an axial pivot for the cutter.

2,852.—THRASHING MACHINE AND SEPARATOR.—Hugh W. Matthews, Chicago, Ill. Patented Aug. 27, 1867.

I claim, 1st, A longitudinally slatted grain rack or platform, C, constructed substantially as described, in combination with vertically and longitudinally moving shakers, D, arranged so as to play between the slats of said rack, substantially as described.

2d, The combination of a thrashing device, a perforated and longitudinally slatted stationary rack, C, and blades or straw shakers, D, operating substantially as described.

3d, A stationary or movable rack, C, composed of perforated slats having longitudinal spaces between them, in combination with serrated blades, D, arranged and operated substantially as described.

4th, The slatted and perforated grain rack, arranged so as to incline toward the thrashing device, and hinged to the main box or frame, substantially as described.

5th, The combination of a slatted rack or grain platform, C, the serrated grain or straw shakers, operating through said grain rack and a conveyer, arranged and operating substantially as described.

2,853.—DREDGING MACHINE.—James H. McLean, St. Louis, Mo. Patented July 9, 1867.

I claim, 1st, The adjustable dredging frame, C, when such adjustment is produced by a derrick, i i, and fall, when constructed and operated substantially as shown and specified.

2d, The scoops, d, of a dredging machine, having circular vertical cutting edges in advance of the usual lateral cutting edge w, fig. 1, when constructed and operating substantially as shown and specified.

3d, In combination with the dredging vessels, the pins, L, for the purpose of moving the same, substantially as described.

4th, The dredger, the receiving and discharging apron, and the derrick of a dredging machine, all in combination, when constructed and operated substantially as shown and specified.

2,854.—LAMP BURNER.—William Painter, Baltimore, and Charles Painter, Owing's Mills, Md., assignees of William Painter by mesne assignments. Patented June 30, 1863.

We claim having the side pieces, h h, and the ends, g g, constructed and arranged in reverse inclined positions, in the manner herein shown and described.

The combination of the attachment above specified with the tubes, F A, the latter being screwed into the fountain or body, B, of the lamp, and inclosing the wick adjusting wheels, b, as set forth.

Making the outer case, F, adjustable upon the tube, A, so that the hight of the cap, G, may be regulated, as and for the purpose set forth.

A deflector or flame spreader, constructed so as to form a continuous plate around the flame, and fashioned so as to cut off the ascending currents of air from the edges of the flame and deflect them against the sides thereof, substantially as described and for the purpose set forth.

2,855.—COAL OIL LAMP.—Joseph Ridge, Richmond, Ind. Patented April 15, 1862.

I claim, 1st, The use of transparent material between the base of the deflector and base of the burner, substantially as described and for the purposes specified.

2d, The combination and arrangement of the base, B, of the burner, the transparent inclosure, M, the deflector, D, and chimney, C, substantially as set forth and for the purposes described.

3d, The base of the chimney, located at a point above the base of the burner, and having interposed between said bases a transparent material.

2,856.—OYSTER DREDGE.—Thomas P. Sink. Fairton, N. J. Patented Oct. 4, 1859.

I claim, 1st, The combination of a horizontal roller, E, turning in bearings adjacent to the gunwale of a vessel, and a horizotal grooved roller or pulley, B, substantially as and for the purpose described.

2d, The combination of a horizontal roller and a vertical roller, when the outer side of the latter is beyond the outer edge of the horizontal roller, and when the said rollers arranged in respect to each other on the gunwale of a vessel substantially as described.

3d, The arrangement and combination, substantially as described, of the chock or block, A, its pulley, B, and the roller, E, for the purpose specified.

2,857.—CRANK PIN BOX.—Thomas Welch, Churchville, N. Y. Patented Aug. 1, 1865.

I claim, 1st, In combination with the adjustable boxes, B D, a pitman, P, so united therewith that it will freely move and work, for the purposes set forth.

2d, In combination with the adjustable boxes and pitman, a, set screw, S, for the purposes set forth.

3d, The combination of the cap, C, with the boxes, B D, pitman, P, and set screw, S, for the purposes set forth.

DESIGNS.

2,905.—LANTERN.—John Alexander, Brooklyn, N. Y., assignor to Geo. W. Brown & Co., Forestville, Conn.

2,906.—MOLDING.—William Baker, New York city.

2,907.—MUFF.—Frederick Booss, New York city.

2,908 and 2,909.—CARPET PATTERN.—Robert R. Campbell, (assignor to Lowell Manufacturing Compaoy), Lowell, Mass. Two patents.

2,910.—CAR BASKET.—Wm. G. Creamer, Brooklyn, N. Y.

2,911.—TRADE MARK.—Charles Gautier, Washington, D. C.

2,912.—PISTOL BARREL.—Emerson Goddard, Brooklyn, N.Y., assignor to E. S. Renwick, New York city.

2,913.—STOVE.—William Hailes, Albany, N. Y.

2,914.—LABEL.—Margaret J. Hays, Allegheny City, Pa.

2,915.—BOTTLE.—Louis Lacour, San Francisco. Cal.

2,916.—FLOOR OILCLOTH PATTERN.—Charles T. Meyer, Bergen, N. J., assignor to Edward C. Sampson.

2,917 and 2,918.—CARPET OR FLOOR OILCLOTH PATTERN.—Charles T. Meyer, Bergen, N. J., assignor to Edward C. Sampson, Two patents.

2,919.—STATUETTE.—Carl Muller, New York city.

2,920.—BASE OR STAND.—Nicholas Muller, New York city.

2,921 to 2,926.—CARPET PATTERNS.—Elemir J. Ney, Lowell, Mass., assignor to Lowell Manufacturing Company. Six patents.

2,927.—TOP.—Joshua Pusey, Philadelphia, Pa.

2,928.—BOTTLE.—Frederick Stearns, Detroit, Mich.

NOTE.—SEVENTY-FOUR Patents in the above list were solicited through the Scientific American Patent Agency. The following samples, out of scores of complimentary letters constantly received at this office, we select for publication, as they came to hand at the same time, and emanated from persons residing at such remote distances apart, thus exhibiting unity of sentiment from one end of our country to the other:—

Thomas C. Hammond, of Sacramento City, Cal., writes us:—"I am much gratified to learn that you have succeeded in procuring a favorable termination of the case without any extra trouble or expense, and, as I consider this result due to the able manner in which you have conducted the case, you will please accept my thanks for your kind attention to the matter, and also the assurance that I shall recommend your Agency as the cheapest and best medium for the procuring of patents in the country. I shall secure your valuable services in the transaction of all matters of this kind that I may have in future."

George W. Wheeler, of Hartford, Vt., says:—"Through your Agency we received the Letters Patent on Wheeler & Allen's water wheel, the 13th of January. We were disappointed in obtaining them so soon—only twenty-eight days from the time of making application to the allowing of the patent! I know of cases in our vicinity that have been on the road from three to five months and are not through yet. You have given entire satisfaction in our case, and we would recommend you to others."

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., 37 *Park Row, N. Y.*

67,167.—EYE GLASS.—Charles Parker, Meriden, Conn., assignee of George N. Cummings, Providence, R. I. Dated July 30, 1867. Application for reissue received and filed Jan. 23, 1868.

I claim, 1st, The continuous spring, B, combined with the two glasses A A, when attached and secured to each of the bows at or near the point, D, in the manner substantially as herein set forth.

2d, The arrangement of the guides, E E, upon each of the bows, and so as to wholly or partially surround the spring at the point above the point, D, and so as to leave the spring free in the said guides, substantially as and for the purpose specified.

562, whole No. 31,566.—DRYING TUNNEL.—Francis H. Smith, Baltimore, Md. Dated Feb. 26, 1861. Application for reissue received and filed Jan. 23, 1868.

1st, I claim the tunnel, A B C, when the same is provided with a furnace, R, and chimney, L, and the whole is constructed and arranged substantially as described and for the purpose specified.

2d, The tunnel, A B C, furnace, R, chimney, L, and gates, F G and H, when the same are so combined and arranged as to operate substantially as described and for the purpose specified.

3d, The tunnel, A B C, furnace, R, and chimney, L, when the same is in combination with the rails, E E, and car, J, and the whole operates substantially as and for the purpose specified.

4th, The furnace, K, having a spiral flue, N, and plates, V and V', when the same is constructed ane arranged so as to operate substantially as and for the purpose specified.

16,094.—MELODEON.—Lafayette Louis, Providence, R. I. Dated Nov. 18, 1856. Reissue No. 2,498, dated Feb. 26, 1867. Application for reissue received and filed Jan. 24, 1868.

I claim in combination with the reeds of a melodeon (or that class of instruments in which the air is drawn through the reeds by the exhaust action of the bellows), a tremolo valve or valves, so arranged that when vibrated it or they shall interrupt the passage of air through the reeds and thereby produce the tremolo sound at the will of the performer.

I also claim in combination with the reeds of a melodeon a rotary fan or blade wheel operating for the purpose of producing or regulating the tremolo.

36,017.—HARVESTER.—Cyrus Newhall, Hinesdale, N. H. Dated July 29, 1862. Application for reissue received and filed Jan. 24, 1868.

1st, I claim the combination in a harvester of a loose driving gear ring revolving on fixed arms with a finger beam suspended from the main frame by connections passing through the driving ring.

2d, The combination with a two-wheeled harvester of a finger beam hinged to the main frame by coupling arms passing through one of the driving wheels.

3d, The combination in a harvester of two wheels, a main frame, a laterally projecting hinged finger beam and a coupling frame, when the frame, the finger beam, and the couplings are all arranged within the periphery of the wheels.

4th, The combination in a harvester of a vertically folding finger beam, with a catch arranged on one of the fixed arms of the driving ring to hold up the cutting apparatus when moving from field to field.

22,681.—COOKING STOVE.—Philo P. Stewart, Troy, N. Y. Dated Jan. 18, 1859. Reissue No. 1,684, dated May 31, 1864. Application for reissue received and filed Jan. 20, 1868. Division A.

1st, I claim the supplying of a continued current of atmospheric air heated by the front plate of the fire box or chamber of combustion and in a flue, chamber or space immediately in front of the same and in combination therewith, without the aid of any intervening plate or plates, to the oven of a cooking stove in which the oven is in the rear of the fire chamber, and at the same time extending under and beyond it so as to include the said flue chamber, or space at the lower part thereof, and thus and thereby permit the said heated air to enter the said oven in the manner and for the purposes substantially as herein described and set forth.

2d, I also claim the flue space or intervening chamber, A A', immediately in front of the fire box or chamber of combustion, with a fire grate and ash pit or chamber combined therewith, and the whole arranged and suspended in the front and upper corner or part of the oven, i, into which space or intermediate chamber atmospheric air is admitted through apertures, X', or any equivalent thereof and therefor, and which are and shall be in and through the plate or door or doors in the front part of the cooking stove, and in combination with the oven of such stove, so that the air heated within such intermediate chamber substantially as herem set forth, may or shall be conducted to and into the oven, for the purposes and by the means substantially as herein described and set forth.

3d, I also claim in a stove constructed with an oven and with a fire box or chamber of combustion having a fire grate therein, and an ash pit or chamber below, and all combined therewith substantially like the one hereinabove described and set forth, the making of the front plate of the stove to open with a door or doors, k, and the attaching an apron in the front of the stove so as to receive and contain a kitchen or other suitable roaster, substantially as specified herein, so that the heat radiated by the front plate of the fire box or combustion chamber shall be aided by the heat radiated by oven plates therein, in the manner and for the purposes substantially as herein described and set forth.

4th, I also claim the employment and arrangement of the front doors, k, constructed with apertures, x', or any equivalent thereof and therefor, therein, in combination with the fire box or chamber of combustion, a, by means of which atmospheric air in a highly heated condition is admitted to the oven of a cooking stove, for the purposes substantially as herein described and set forth.

5th, I claim the employment and arrangement of a door or doors, k, or any equivalent thereof and therefor, so that the same, or a part thereof shall open (in the front of the cooking stove) in front of the fire box or chamber of combustion having a fire grate therein, and ash pit or chamber combined therewith, and arranged and suspended in the front part of the oven of a cooking stove, in the manner and for the purposes substantially as herein described and set forth.

6th, I claim the arrangement of a fire chamber or chamber of combustion with a fire grate and an ash pit or ash chamber combined therewith, and the whole suspended in the front part and upper corner of the oven of a cooking stove, in the manner and by the means substantially as herein described and set forth.

7th, I also claim the employment and arrangement of the additional or extra bottom and encasement, r, in combination with the flues of the bottom of a cooking stove and immediately underneath the oven, i, and with the space or chamber between the same and the bottom plate of the stove, in the manner and for the purposes substantially as herein described and set forth.

8th, I also claim the employment and arrangement of the additional or extra back or encasement, in combination with the ascending and descending flues in the rear end of a cooking stove, and between the rear end of the oven and the rear vertical end plate of the stove, in the manner and for the purposes substantially as herein described and set forth.

9th, I also claim the employment of a corrugated plate for the top of the oven, i, in combination with the flue, h, and fire chamber or chamber of combustion and with the rear end vertical plate of the oven of a cooking stove, in the manner substantially as and for the purposes herein set forth.

10th, I also claim the employment and arrangement of the front damper or valve, Y, in the front and hearth of a cooking stove, in combination with the flue or flues, as the case may be, immediately underneath the oven and bottom plate of the oven of a cooking stove, in the manner and for the purposes substantially as herein described and set forth.

11th, I also claim the employment and arrangement of the damper, or any equivalent thereof, and so combined with the flue or flues of a cooking stove having a boiler or reservoir supported outside and back of the rear vertical end of a cooking stove and over a heating chamber or flue, so that the direct action of the heat upon such boiler or reservoir may be thrown or shut off, and the same caused to pass through other parts and flues of said cooking stove before entering such chamber immediately underneath such boiler or reservoir and acting thereon for the purpose of warming or heating the water therein, in the manner substantially as herein described and set forth.

12th, I also claim the employment and arrangement of the boiler or reservoir having a removable or detachable cover or top, and containing two inclined flues or tubes, which are separate, at the bottom or lower end thereof, from each other, and which unite at the top or under end thereof, and thus and then form but one pipe, in the manner and for the purposes substantially as herein described and set forth.

22,681.—COOKING STOVE.—Philo P. Stewart, Troy, N. Y. Dated Jan. 18, 1859. Reissue No. 1,684, dated May 31, 1864. Application for reissue received and filed Jan. 20, 1868. Division B.

1st, I claim the employment and arrangement of the top plate of a cooking stove having a flue or flues immediately thereunder and extended over and beyond the rear end and upper portion of the vertical flue or flues back of the oven thereof, in such manner as to receive and support a reservoir or water tank upon or over a suitable opening therein and with a heating chamber immediately below or underneath the same, in the manner and for the purposes substantially as herein described and set forth.

2d, I claim the arrangement and employment of the heating chamber or flue, D, or its equivalent, in combination with the rear vertical end flue or flues of a cooking stove, and with the reservoir or water tank, C, in the manner and for the purposes substantially as hereinbefore fully described and set forth.

3d, I claim the combination of the flue or chamber, D, extending beyond the rear end of a cooking stove, and situated under or immediately below the reservoir or water tank, C, with the flue, H, extending from the fire chamber or chamber of combustion and over the top plate of the oven, and with the vertical rear end flue or flues of a cooking stove, in the manner and for the purposes substantially as herein described and set forth.

4th, I claim the arrangement and employment of the reservoir or water tank, C, in or upon and with the extended top plate, A and A', of a cooking stove, and heating chamber or flue, D, in combination with the heating or warming closet, S, in the manner and for the purposes substantially as herein described and set forth.

5th, I claim the arrangement and combination of the heating or warming closet, S, or any equivalent thereof, upon the rear end of a cooking stove containing a vertical flue or flues, in the manner and for the purposes substantially as herein described and set forth.

6th, I claim an opening, O, in and through the rear end vertical plate of a cooking stove, of sufficient capacity to allow the passage of hot air or of the heated escaping products of combustion through the same and into a flue or chamber underneath a reservoir or water tank, so as to warm or heat the water therein, in the manner substantially as herein described and set forth.

7th, I claim the combination of an exit chimney pipe or flue or flues with the heating chamber or flue, D, underneath the reservoir or water tank, C, in the manner and for the purposes, substantially as herein described and set forth.

8th, I claim the arrangement of a reservoir or water tank upon the extended top plate of a cooking stove and supported over or beyond the rear end vertical flue or flues of a cooking stove, in the manner and for the purposes substantially as herein described and set forth.

9th, I claim the construction of a vertical end plate of a cooking stove containing the opening, O, or any equivalent, therein, for the passage of the hot air or escaping heated products of combustion into a suitable chamber underneath the reservoir or water tank, combined with a cooking stove in the manner substantially as herein described and set forth.

10th, I claim the chamber or flue, P, or any equivalent therefor, arranged upon the rear end plate of a cooking stove and extending outward therefrom, in the manner and for the purposes substantially as herein described and set forth.

11th, I claim the combination of the chamber or flue, P, with the reservoir or water tank, C, in the manner and for the purposes substantially as herein described and set forth.

12th, I claim the combination of the chamber or flue, P, with the vertical flue or flues between the oven and the rear end plate of a cooking stove and with the chamber, D, in the manner and for the purposes substantially as herein described and set forth.

37,526.—PATTERNS FOR CUTTING BOOTS.—Elias Shopbell, Ashland, Ohio. Dated Jan. 27, 1863. Application for reissue received and filed Jan. 24, 1868.

1st, I claim the plate, A, in combination with the pairs of plates, B B' C C and D D', or their equivalents, with their respective slots and angles, producing the simultaneous movement of the several pairs of plates and the consequent unequal enlargement and construction of the pattern, substantially as herein set forth.

2d, The stationary and adjustable plates, so constructed and arranged in relation to each other and the slots as to produce a simultaneous expansion and contraction, substantially as described, according to any required size of the boot.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of* 30 *days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application.* MUNN & CO., *Solicitors of Patents, 37 Park Row, N. Y.*

Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

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3,542.—TREATMENT OF GUTTA PERCHA, INDIA RUBBER, ETC., FOR PRODUCING CEMENT PAINT, STAIN, ETC.—Daniel Reed, New York city, Dec. 13, 1867.

3,661.—RAILWAY RAIL.—Thomas Harbison, New York city. Dec. 24, 1867.

3,674.—BLANKET FOR PRINTING MACHINES, AND MODE OF JOINING THE ENDS OF DOUBLE-WOVEN FABRICS.—Seth W. Baker, Providence, R. I. Dec. 27, 1867.

3 690.—MAKING SHOT AND SHELLS FOR ORDNANCE.—John B. Tarr, Fair Haven, Conn. Dec. 28, 1867.

3,690.—GENERATING AND APPLYING MOTIVE POWER.—Benj. T. Babbitt, New York City. Dec. 28, 1867.

3,696.—GAS BURNER.—Willis Churchill, New York city. Dec. 28, 1867.

3,537.—MANUFACTURING CAST STEEL AND MALLEABLE IRON.—Edward L. Seymour, New York city. Dec. 12, 1867.

3,622.—CIRCULAR KNITTING MACHINE.—Geo. Johnstone, Philadelphia, Pa. Dec. 20, 1867.

3,681.—SOLES FOR BOOTS AND SHOES.—John Chilcott, Brooklyn, N. Y. Dec. 27, 1867.

3,689.—BUTT HINGE.—Benj. F. Barker, San Francisco, Cal. Dec. 28, 1867.

3,691.—APPARATUS FOR CUTTING SOAP.—Campbell Morfit, New York city. Dec. 28, 1867.

3,716.—MANUFACTURE OF HATS, ETC.—Rudolf Eickemeyer, Yonkers, N. Y. Dec. 31, 1867.

3,719.—MACHINERY FOR SPINNING COTTON, ETC.—James Eaton, Boston, Mass. Dec. 31, 1867.

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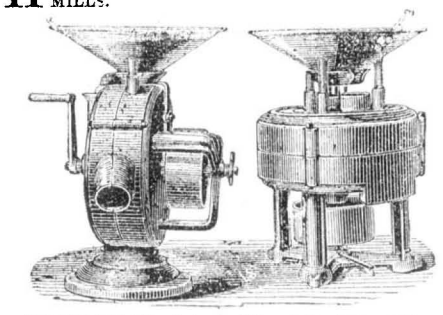

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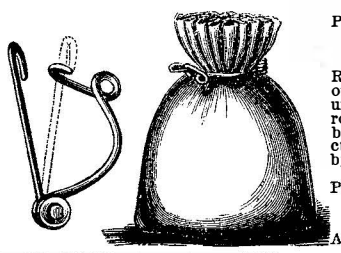

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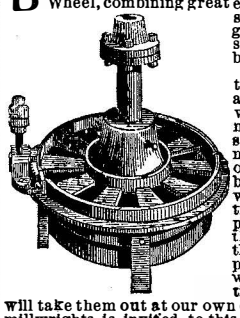

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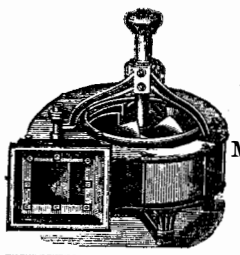

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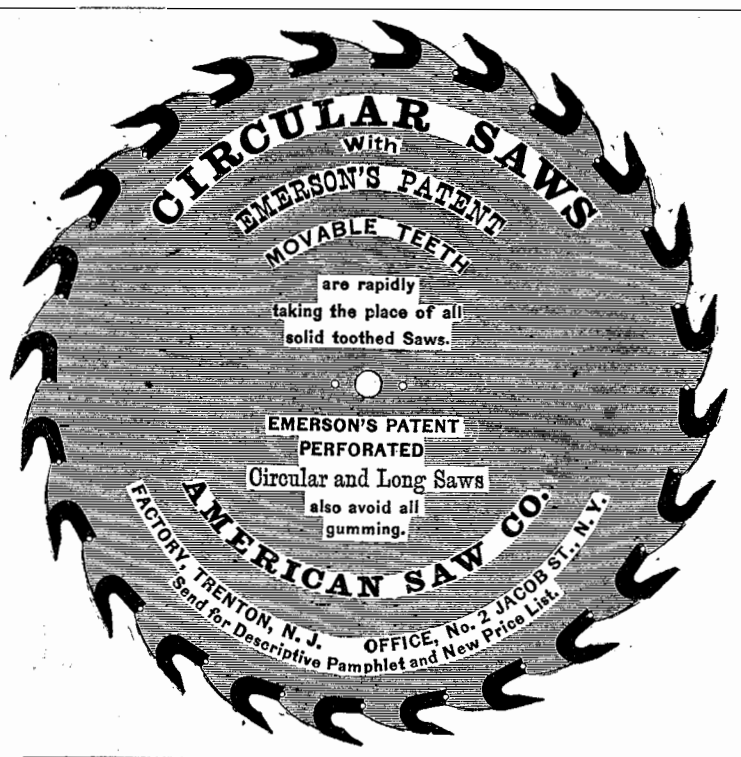

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